FACT SHEET FOR NPDES PERMIT NO. WA-002402-3

CITY OF YAKIMA PUBLICLY-OWNED TREATMENT WORKS

SUMMARY

The City of Yakima is seeking reissuance of its National Pollutant Discharge Elimination System (NPDES) for its Regional Publicly-Owned Treatment Works (POTW). The Regional POTW serves the City of Yakima, the City of Union Gap, the Terrace Heights Sewer District (which lies east of Yakima), and additional customers within the urban growth management area. The Regional POTW provides wastewater collection and treatment to approximately 96,000 people within the service area. During the term of the current permit issued in 2003, the City has remained in substantial compliance with the conditions and responsibilities in the permit.

A significant operational change undertaken in 2001 by the City was to treat process wastewater from Del Monte Corporation, a significant industrial user, using the trickling filter/activated sludge process in the main treatment plant rather than on the previously utilized Industrial Waste Sprayfield. The City has upgraded some treatment plant processes to better accommodate the additional waste loadings. The City has submitted and the Department has approved the City of Yakima 2004 Wastewater Facilities Plan with new Design Criteria.

The previous permit authorized the City to develop and implement a partially delegated pretreatment program. In June 2000 the City submitted to the Department an application for full pretreatment authority. On June 15, 2003 the City received full delegation authority.

This permit contains final effluent technological limits for BOD, TSS, pH, a chronic WET limit and water quality based limits for Residual Chlorine and Fecal Coliform bacteria. In addition, this permit requires routine monitoring of the treatment plant influent from domestic and industrial sources and the final effluent.

The metal limits contained in the current permit have been reevaluated in light of the City's recent Metals Study Assessment Report, which demonstrated erroneous hardness data provided by the City caused an incorrect reasonable potential determination at the time the current permit was written. As a result of the Assessment Report finding of no reasonable potential, limitations for copper, zinc, lead and silver are not required in the proposed permit.

Monitoring for phosphorous and nitrogen is required in order to characterize the nutrient constituents in the final effluent in anticipation of a pending Lower Yakima River TMDL and possible nutrient Wasteload Allocations (WLAs).

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INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has authorized the State of Washington to administer the NPDES permit program. Chapter 90.48 RCW defines the Department of Ecology's authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the State include procedures for issuing permits (Chapter 173-220 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least thirty days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see Appendix A--Public Involvement of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

GENERAL INFORMATION	
Applicant	City of Yakima
Facility Name and Address	City of Yakima Regional Publicly-Owned Treatment Works 2220 E. Viola Avenue Yakima, WA 98901
Treatment Processes:	Activated sludge with primary and secondary clarifiers, trickling filters, and chlorine disinfection with dechlorination.
Discharge Location	Yakima River, River Mile 110.1 Latitude: 46º 34' 48" N Longitude: 120º 27' 52" W.
Water Body ID Number	WA-37-1040

BACKGROUND INFORMATION

The City of Yakima (City) is located in south-central portion of the State, and is the largest city and the commercial center of Yakima County. The City is bordered by the Naches River to the north, the Yakima River to the east, the City of Union Gap to the south, and unincorporated West Valley to the west. The treatment plant and deactivated sprayfield are located in southeast Yakima, to the west of the Yakima River.

DESCRIPTION OF THE FACILITY

Main Treatment Plant History

The City's Publicly-Owned Treatment Plant (POTW) was originally constructed in 1936 as a primary treatment facility. Improved control of water pollution was accomplished by the separation of industrial and domestic sewage in 1955 and the associated construction of an industrial waste sprayfield. The POTW was upgraded in 1965 by the addition of trickling filter biological treatment.

In 1982-1983, the City put into service four concrete activated sludge aeration basins and two secondary clarifiers in order to meet the requirements of secondary wastewater treatment. In 1987-1988, the POTW improved the oxygen transfer in the aeration basins by the installation of a fine-bubble air diffusion system.

During the period from 1991 to 1996 many major POTW upgrades were made, including:

(1) Modification of existing outfall;
(2) Construction of an oil/water separator on one of the influent side streams;
(3) Modification of the headworks to include two new barscreens, and 2 solids screening compactors;
(4) Replacement of the entire grit removal system;
(5) Construction of a new trickling filter pump station;
(6) Construction of an intermediate degritter for removing snails from trickling filter effluent prior to discharge to activated sludge aeration basins;
(7) Addition of domes to trickling filters with an integrated odor control system;
(8) Construction of a dechlorination facility;
(9) Addition of a second centrifuge for increased biosolids handling;
(10) Modifications to the biosolids drying beds;
(11) Paving and improvements of the biosolids storage area;
(12) Expansion of laboratory for monitoring non-conventional pollutants;
(13) Secondary clarifier flocculation wells and baffles;
(14) Digester mixing;
(15) Digester gas storage;
(16) Improved C-2 water pumping system;
(17) Super-chlorination of C-2 water for meeting water reuse standards; and
(18) SCADA improvements.

During the 1990s, the City made significant changes in its management and operation of the POTW, as well as its relationship to the system's non-domestic dischargers. Improvements included:

(1) Certification of the onsite laboratory for the atomic absorption and gas chromatograph analytical procedures;
(2) Significant expansion of its Partial Pretreatment Program, including:
    a. Extensive monitoring of non-domestic discharges;
    b. Addition of more program-dedicated personnel; and
    c. Submission of various components pertaining to the ultimate delegation of a Partial Pretreatment Program from the Department;
(3) Updating the Industrial User Survey (IUS);
(4) Increasing personnel to allow for better overall facility operation and management; and
(5) The purchase and use of various equipment for the inspection and maintenance of the collection systems.

At present, the wastewater treatment processes utilized by the City consist of a headworks with barscreens, screenings compactor, grit removal; Parshall flume; primary clarification; trickling filters; trickling filter clarification; diffused aeration activated sludge; secondary clarification; anaerobic digestion; centrifugal biosolids dewatering; centrate lagoons; chlorination disinfection; dechlorination; an outfall and process control buildings.

The 2004 Facilities Plan has identified 20 priority improvements (Table 12-2 in the 2004 Facilities Plan) to the wastewater treatment facility. The improvements could be complete in the next 6 years dependant upon funding for the projected 17.5 million dollar suite of improvements. Those improvements over 1 million dollars in cost are presented below:

1. New Blowers in New Blower Building
2. New Centrifuge and Polymer System
3. New Dissolved Air Floatation Technology Unit
4. Centrate Equalization Tankage
5. UV Disinfection
6. Enclosed Trailer and Cake Storage Facility
7. Odor Control Improvements
8. New RAS Pumping station for new Secondary Process Units

The Yakima treatment plant is categorized by the Department as a Class IV facility, based on its design flow of more than 10 million gallons per day (MGD) and its primary treatment type, in accordance with WAC 173-230-140.

The principal treatment plant operator of this system must be a Class IV wastewater treatment facility operator certified by the State of Washington.

Sprayfield

The City's deactivated industrial waste sprayfield is located on approximately 100 acres between Interstate 82 and the Yakima River, and immediately to the east and south of the main treatment plant. The industrial collection system and sprayfield were constructed in 1958 due to the overloading of the City POTW by the nine original industrial wastewater dischargers (fruit and vegetable processors). The last remaining discharger to the City's industrial waste system was Del Monte Corp Plant #125, a large-volume fruit processor. The industrial waste sprayfield was typically used from June through November, with a small amount of industrial wastewater being treated by the main treatment facility during the rest of the year.

In a letter dated April 18, 2001, the City notified the Department that process wastewater from Del Monte, which would normally be land applied to the sprayfield, would be treated at the main treatment plant. The City wanted to determine the treatability of Del Monte's wastewater by the trickling filter/activated sludge process in the main treatment plant. The experiment was successful and, at this time, the City has no plans to reactivate the sprayfield. This permit does not authorize any further wastewater discharges to the sprayfield. Groundwater monitoring at the sprayfield site will be required to be conducted according to an approved Sprayfield Sampling and Analysis Plan contained in Appendix C of the approved O&M Manual and as amended by the City of Yakima's Proposed monitoring schedule of February 15, 2006 and Robert L. Raforth's letter of February 23, 2006.

Collection System Status

The City has two separate collection systems that convey wastewater to the POTW: a sanitary and an industrial waste system. The industrial wastewater collection system conveys process wastewater from the Del Monte processing plant to the POTW.

The original sanitary wastewater collection system consisted of open ditches which discharged untreated effluent directly into the Yakima River. Construction of the system began in 1890 and was completed in 1912. The collection system was significantly expanded between 1922 and 1926. The present sanitary collection system consists of more than 317 miles of vitrified clay, concrete, asbestos-concrete and PVC pipe which presently serves approximately 96,000 persons. The collection system piping incorporates diameters from 6 inches through 48 inches and conveys wastewater to the POTW from the City of Yakima, the City of Union Gap, the Terrace Heights Sewer District and unincorporated portions of Yakima County.

By the early 1990s there were significant inflow and infiltration (I&I) problems with the collection system due to old leaky sewers, root intrusion, unlined irrigation canals, leaky irrigation water distribution lines, stormwater and non-contact cooling water connections. Since 1990, the City has been aggressively rehabilitating deficient portions of the collection system. Through the end of 1994, the City was able to reduce the quantity of I&I by over 2.25 MGD. The City will continue its efforts to reduce I&I in the future as recommended in the Comprehensive Plan, and has recently grouted over 15 miles of sewer. The 2004 Facilities Plan lists over 8.6 million dollars in needed priority improvements to be completed in the next 6 years dependant upon funding.

Discharge Outfall

Secondary treated and disinfected effluent is discharged to the Yakima River at River Mile 110.1 via two 24-inch diameter steel pipes, each terminated by a 10-inch x 34-inch rectangular diffuser port. The POTW outfall is located approximately 30 feet offshore at a depth of 10 feet (6.1 feet at 7Q10).

Residual Solids

The treatment facilities remove solids at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained, compacted and disposed of as solid waste at the local landfill. Solids removed from the clarifiers are treated anaerobically, dewatered and land applied under a permit from the Yakima Health District.

PERMIT STATUS

The current permit for this facility was issued on April 30, 2003. The current permit placed effluent limitations on the discharge to the Yakima River on the following parameters: 5-day Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), pH, Fecal Coliform Bacteria, Copper, Zinc, Lead, Silver, Chronic WET Limit, Total Residual Chlorine and Total Ammonia.

An application for permit renewal was submitted to the Department on December 6, 2005 and accepted by the Department on December 13, 2005. The City has requested that the Department reissue its permit two years prior to the normal permit expiration date in order to remove metal limits, reduce wet testing and sprayfield monitoring. The City has provided documentation of erroneous reporting of hardness data led to unnecessary metals limits. WET test monitoring has found no acute or chronic toxicity in the effluent for the past three years; however sporadic chronic toxicity is still a concern of the Department. The sprayfield has been decommissioned since 2000 and groundwater monitoring is ongoing.

Normally the Department will change permit requirements and limits via a permit modification prior to permit expiration. The Department has developed a river basin schedule approach to permit reissuance therefore; the Department will reissue the permit as it will place the City permit within the basin wide schedule along with other Lower Yakima River Basin permit holders.

SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT

A compliance inspection without sampling was conducted on January 19, 2005. The Department's inspectors found a well-run and well-maintained facility.

During the history of the previous permit, the Permittee has remained in substantial compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The City reported one 1000 gallon spill caused when a telephone utility broke a side sewer that carries wastewater from an industrial user and an overflow of 180 gallons of domestic wastewater on June 29, 2005. Minor violation consisted of 5 pH exceedances attributed to a faulty pH probe, five missed sampling events and one exceedance of the residual chlorine limit on August 25, 2005.

The current permit required numerous submittals. Some of the reports are routine for any major municipal discharger, such as DMRs and WET Testing, and others are required with the delegation of pretreatment authority specified in this permit. The Permittee has to date met all report submittal obligations.

WASTEWATER CHARACTERIZATION

Combined Industrial and Domestic Influent

Conventional Pollutants

Monthly influent characterization data are presented in Table 1 in comparison to design loadings. Data reflect influent loadings reported in DMRs submitted during calendar years 2003 through 2005. Use of the industrial sprayfield ceased on October 3, 2000. Wastewater from Del Monte is treated by the trickling filter and activated sludge processes. Del Monte sends all its process wastewaters to the treatment plant and the data reflect these loadings.

Table 1: Characterization of Conventional Pollutant Influent Loadings

Parameter	2001		2003 -2005		2004 *	2004
	Annual Average	Max Month Loading	Annual Average	Max Month Loading	Monthly Design Loading	% of Design
Flow, in MGD	11.92	16.16	11.1	14.8	21.5	51.6
BOD_5, in lbs/day	31,691	42,231	27,176.1	37,726	53,400	50.9
TSS, in lbs/day	21,588	28,542	20,453.7	27,964	38,600	53

* According to the approved 2004 Yakima Wastewater Treatment Facility Plan

Del Monte Wastewater

Del Monte Plant #125 is one of the largest industrial dischargers to the City's treatment plant. Del Monte's main processing season typically occurs from August through November, when pears are processed. During the 2005 processing season, Del Monte's monthly average BOD discharge ranged from 886 lbs/day to 13,198 lbs/day or up to approximately 40 percent of total BOD loadings to the treatment plant. Hydraulic (flow) and suspended solids loadings were relatively minor. In addition, Del Monte typically processes cherries for 2-3 weeks during the summer, but loadings to the treatment plant are minor at approximately 900 lbs/Day.

Effluent

The concentration of pollutants in the discharge was reported in the NPDES application and DMRs submitted to the Department. In the case of pollutants limited in the current permit, the characterization is given in the context of the permit limit.

Conventional Pollutants

BOD and TSS

Average monthly BOD and TSS effluent concentrations are characterized for 2001 and the 2003-2005 timeframe in Table 2. Effluent characteristics for 2001 are profiled because this was first year the City treated all of Del Monte's wastewater in the main treatment plant.

Table 2: Characterization of Effluent BOD and TSS

Parameter	2001		2003 -2005		Monthly Permit Limits	Annual Average as Percent Average Monthly Limit
	Annual Average	Highest Monthly Average	Annual Average	Highest Monthly Average	Highest Monthly Average	
BOD_5, in mg/L	10.3	20	7.8	15	30	26
TSS, in mg/L	8.3	18	6.1	14	30	20.3

During 2003 - 2005, the highest monthly averages for BOD occurred in December 2004 and TSS occurred in October 2005. The lowest percent removal rate for these 2 parameters during the 2003 - 2005 processing season was 94.9% for BOD and 94% for TSS which occurred in October 2005. These data suggest that with the additional process unit in operation process wastewater discharges from Del Monte has little, if any, discernable impact on treatment efficiency of the treatment plant.

Fecal Coliform

Table 3 contains a summary of fecal coliform bacteria for 2003 - 2005.

Table 3: Characterization of Effluent Fecal Coliform Bacteria

Parameter	2003 -2005 Average	Highest Reported Average Monthly	Average Monthly Permit Limit	Highest Reported Average Weekly	Average Weekly Permit Limit
Fecal Coliform Bacteria, in # colonies/100 mL	42	96 *	200	299 *	400

* Both highest month average and highest weekly average occurred in August 2005.

The highest fecal concentrations occurred during August 2005 at 299 colonies per 100 ml and are not representative of the year's discharges. The second highest monthly average reported for the year was 49 colonies/100 mL and the second highest weekly average reported for the year was 128 colonies/100 mL, well below the permit limits.

pH

During 2003 -2005, the lowest reported pH was 5.87 and the highest reported pH was 7.3. The reported value of 5.87 was the lowest of three exceedances of the permit limit during the 29 month period.

Ammonia and Residual Chlorine

In the current permit, average monthly and maximum daily effluent limits for ammonia and residual chlorine were established. Table 4 presents an effluent characterization of these pollutants, based on the 2003 - 2005 data, and their respective permit limits.

Table 4: 2003 – 2005 Ammonia and Residual Chlorine Effluent Characterization

Parameter	Units	Highest Reported Average Monthly	Average Monthly Permit Limit	Highest Reported Maximum Daily	Maximum Daily Permit Limit
Ammonia	mg/L	1.26	4.16	8.87	12.3
Total Residual Chlorine	mg/L	<0.006	0.012	0.041 *	0.029

* 0.041mg/L residual chlorine represents only one violation of the permit limitations for the entire time frame. The Department issued a notice of violation for the exceedance on October 11, 2005.

The City dechlorinates its discharge to minimize chlorine residual. The method detection level analytical method utilized by the treatment plant laboratory is 0.006 mg/L.

Priority Pollutants

A characterization of priority pollutants was reported in the City's most recent NPDES application. All metals results are reported as total recoverable and are reported in Table 5. Other toxic organic compounds are reported in the table when they were present at concentrations higher than the Minimum Detection Level (MDL).

The City submitted results of 3 effluent pesticide characterizations. Sampling occurred on September 3, 2003, September 7, 2004 and September 12, 2005. The 2 pesticides found to be present in the effluent during the last permit cycle, Beta BHC and Beta Endosulfan, were not detected in any of these samples.

Table 5: Effluent Characterization 2003-2005

Parameter	Units	Maximum Value	Average Value	MDL	Number of Samples
Inorganic Compounds					
Arsenic	µg/L	1.46	0.984	0.15	5
Cadmium	µg/L	0.097	0.075	0.008	8
Chromium	µg/L	0.70	0.274	0.07	8
Copper	µg/L	11.50	6.41	0.04	29
Lead	µg/L	0.898	0.582	0.015	29
Mercury	µg/L	0.0074	0.0046	0.00015	7
Nickel	µg/L	1.33	0.864	0.04	8
Silver	µg/L	0.961	0.274	0.015	29
Zinc	µg/L	60.0	47.3	0.10	29
Hardness, as $CaCO_3$	mg/L	124.0	81	5	124
Organic Compounds					
Chloroform	µg/L	3.46	2.14	0.049	3
Toluene	µg/L	2.54	1.51	1.0	3

SEPA COMPLIANCE

The Permittee has completed the State Environmental Policy Act (SEPA) process and was issued a Determination of Non-Significance on January 19, 2005 for the 2004 Wastewater Facility Plan.

PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the State of Washington were determined and included in this permit. Ecology does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are

not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation**.** Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department of Ecology. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants**.**

DESIGN CRITERIA

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from page 5-46 of the Yakima Regional Wastewater Treatment Plant 2004 Wastewater Facility Plan engineering report prepared by Black and Veatch and are as follows:

Table 6: Design Standards for Yakima Regional WWTP

Parameter	Design Quantity
Monthly average flow (max. month)	21.5 MGD
BOD_5 influent loading (max. month)	53,400 lb./day
TSS influent loading (max. month)	38,600 lb./day
Design population equivalent	130,000

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD_5, and TSS are taken from Chapter 173-221 WAC:

Table 7: Technology-based Limits

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD_5 (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
Residual Chlorine	Average Monthly Limit = 0.5 mg/L Average Weekly Limit = 0.75 mg/L

The technology-based monthly average limitation for chlorine is derived from standard operating practices. The Water Pollution Control Federation's Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/liter chlorine residual is maintained after fifteen minutes of contact time. See also Metcalf and Eddy, Wastewater Engineering, Treatment, Disposal and Reuse, Third Edition, 1991. A treatment plant that provides adequate chlorination contact time can meet the 0.5 mg/liter chlorine limit on a monthly average basis. According to WAC 173-221-030(11)(b), the corresponding weekly average is 0.75 mg/liter.

The existing permit has a water quality based residual chlorine average monthly limit of 12 ug/L and a maximum daily limit of 29 µg/L the facility is able to comply with it. The proposed permit contains slightly upward revised limitations based on newly derived, higher dilution factors.

BOD and Oxygen Demand

Although the Lower Yakima River (segments downstream of the Yakima facility) is listed as water quality-impaired for DO on the current 303(d) list, it is not possible for Ecology to determine reasonable potential for the Yakima STP effluent to cause or contribute to this situation. Ecology used the Streeter-Phelps model to evaluate the need for water quality-based effluent limits for the previous draft permit. The State considers the Streeter-Phelps model to be a screening tool to determine whether additional analysis is necessary when an impact is

indicated. The results of this model indicated that additional analysis is necessary. However, due to multiple point and non-point sources that also contribute to the DO problem in this area, the State cannot adequately model the Yakima STP effluent without accounting for the other discharges. Specifically, other downstream dischargers to the river include: nine municipal treatment plants, two industrial food processors, 10 agricultural return drains, and seven small tributary streams that receive agricultural runoff.

The waters of the return drains and streams carry oxygen-demanding pollutants from many non-point sources that have not been fully characterized or quantified by the State. Since the State has already identified the need for a DO TMDL to determine point source waste load allocations and non-point load allocations, Ecology believes that it would not be appropriate to set single facility waste load allocations because BOD is not a conservative pollutant and requires a comprehensive assessment of all contributing sources in the watershed to ensure the long-term health of the Yakima River. Additionally, the facility has technology-based effluent limits in the permit that will prohibit the facility from further impairment of the Yakima River. The final permit will contain BOD effluent limitations based on the secondary treatment standards (monthly average of 30 mg/L and weekly average of 45 mg/L).

SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL).

All spreadsheets used by the permit writer to develop the conditions of this permit may be found in Appendix C of this fact sheet. Generally, they are arranged in the order in which they are discussed in this fact sheet.

Numerical Criteria for the Protection of Aquatic Life

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

Numerical Criteria for the Protection of Human Health

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of the receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when receiving waters are of higher quality than the criteria assigned, the existing water quality shall be protected. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

Critical Conditions

Surface water quality-based limits are derived for the water body's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses. The critical condition for the pollutants in this discharge occurs July through September.

Mixing Zones

This permit authorizes an acute and a chronic mixing zone around the point of discharge as allowed by Chapter 173-201A WAC, *Water Quality Standards for Surface Waters of the State of Washington*. The Water Quality Standards stipulate some criteria be met before a mixing zone is allowed. The requirements and Ecology's actions are summarized as follows:

1. The allowable size and location be established in a permit.

This permit specifies the size and location of the allowed mixing zone.

For this discharge, the percent volume restrictions of the Water Quality Standards resulted in a lower dilution factor than the distance and width restrictions. Therefore, the dilution factor calculated represents a 10 year low flow which was used to determine reasonable potential to exceed water quality standards.

2. Fully apply "all known available and reasonable methods of treatment" (AKART).

The technology-based limitations determined to be AKART are discussed in an earlier Section of this fact sheet.

3. Consider critical discharge condition.

The critical discharge condition is often pollutant-specific or water body-specific and is discussed above.

4. Supporting information clearly indicates the mixing zone would not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with the existing or characteristic uses, result in damage to the ecosystem or adversely affect public health.

The Department of Ecology has reviewed the information on the characteristics of the discharge, receiving water characteristics and the discharge location. Based on this information, Ecology believes this discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem or adversely affect public health.

5. Water quality criteria shall not be violated (exceeded) outside the boundary of a mixing zone.

A reasonable potential analysis, using procedures established by USEPA and the Department of Ecology, was conducted for each pollutant to assure there will be no violations of the water quality criteria outside the boundary of a mixing zone.

6. The size of the mixing zone and the concentrations of the pollutants shall be minimized.

The size of the mixing zone (in the form of the dilution factor) has been minimized by the use of design criteria with low probability of occurrence. For example, the reasonable potential analysis used the expected 95^{th} percentile pollutant concentration, the 90^{th} percentile background concentration, the centerline dilution factor and the low flow occurring once in every 10 years. The concentrations of the pollutants in the mixing zone have been minimized by requiring pollution prevention measures where applicable.

7. Maximum size of mixing zone

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute Mixing Zone

A. Acute criteria met as near to the point of discharge as practicably attainable

The acute criteria have been determined to be met at 10% of the distance of the chronic mixing zone.

B. The concentration of, and duration and frequency of exposure to the discharge, will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.

The toxicity of pollutants is dependent upon the exposure which in turn is dependent upon the concentration and the time the organism is exposed to that concentration. For example EPA gives the acute criteria for copper as "freshwater aquatic organisms and their uses should not be affected unacceptably if the 1- hour average concentration (in µg/l) does not exceed the numerical value given by $(0.960)(e^{(0.9422[\ln(\text{hardness})] - 1.464)})$ more than once every three years on the average." The limited acute mixing zone authorized for this discharge will assure that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water assuring that it will not cause translocation of indigenous organism near the point of discharge.

C. Comply with size restrictions

The mixing zone authorized for this discharge meets the size restrictions of WAC 173-201A.

9. Overlap of Mixing Zones

This mixing zone does not overlap another mixing zone.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

Calculation of Dilution Factors in the Current Permit

In support of the previous permit, the Department's Environmental Assessment determined the 7Q10 (lowest seven-day average river flow with a recurrence interval of ten years) of the Yakima River (USGS 12500405) to be 632 cfs based on flow monitoring data for the period of record 1968 to 1995. Use of this value appears appropriate because, in response to comments to the previous permit, the permit writer stated that flows of 632 cfs or lower occurred in 1988 and 1993.

The Department used the above 7Q10 value, in conjunction with subsequent velocity data provided in a May 27, 1997 letter from HDR Engineering, Inc., and determined the acute and chronic mixing zone dilution factors to be 1.51 and 6.61, respectively. In accordance with WAC 173-201A-100, the acute dilution factor was calculated utilizing 2.5% of the 7Q10 flow of the Yakima River, and the chronic dilution factor was calculated utilizing 25% of the 7Q10 flow of the Yakima River. The fact sheet associated with the current permit stated that the RIVPLUME5 model was used to calculate these dilution factors.

The spreadsheet used to calculate dilution factors in the previous permit was not preserved. When the effluent and receiving water flows were inserted into RIVPLUME5 to confirm the dilution factors for this permit, the resulting dilution factors were 13.97 (acute) and 43.25 (chronic). However, utilization of a simple mass-balance calculation resulted in the more conservative dilution factors.

Dilution Factors in the Proposed Permit

Dilution factors were recalculated using a new value representing the 7Q10 at 835 cfs (Appendix B of the City of Yakima's Draft 2004 Wastewater Facility Plan) calculated by Bill Fox of the Cosmopolitan Engineering Group and approved by the Department.

The dilution factors of effluent to receiving water that occur within these zones have been determined at the critical condition by the use of a simple mass balance equation, which uses the approved 835 cfs for the Yakima River and data obtained for the Permittee's Discharge Monthly Reports.

Acute Dilution Factor

$$\frac{\text{2.5 \% of 7Q10 (835 CSF) + Highest Daily Effluent Flow in 3 Years (24.361 cfs)}}{\text{Highest Daily Effluent Flow in 3 Years (24.361 cfs)}}$$

= Acute Dilution Factor: **1.86:1**

Chronic Dilution Factor

$$\frac{\text{25 \% of 7Q10 (835 CSF) + Highest Monthly Effluent Flow in 3 Years (22.886 cfs)}}{\text{Highest Monthly Effluent Flow in 3 Years (22.886 cfs)}}$$

= Chronic Dilution Factor: **10.12:1**

The dilution factors calculated by the Department are slightly higher than the dilution factors contained in the Permittee's 2005 Effluent and Receiving Water Study because more recent effluent data was used in the calculation, which was approximately 20% lower than that used in the Permittee's study. New dilution factors will be calculated at the time of permit renewal with the updated data set.

Description of the Receiving Water

The facility discharges to the Yakima River, which is designated as a Class A receiving water in the vicinity of the outfall. Other nearby point source outfalls include Snokist, a fruit processor, approximately 1 mile upstream. Significant nearby non-point sources of pollutants include discharge points for urban stormwater and runoff from agricultural lands. Characteristic uses include the following:

> water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

The Department's 303(d) list is a compilation of all water bodies in the State with documented exceedances of the water quality standards. The most current compilation, the 1998 303(d) list, designates the segment of the Yakima River to which the facility discharges, WA-37-1040, as water quality-impaired for pH.

The fact sheet associated with the previous permit stated that this segment of the river was also listed for DDT, 4,4-DDE, Dieldrin and pH. However, further research revealed that although water quality-impaired status was proposed for these pollutants, they were not included on either the final 1996 or 1998 lists because violations of the water quality criteria were documented only

once per parameter during the 1980's. Similarly, the present listings for mercury and silver are based on excursions documented in the late-1980s, and confirmation monitoring will occur before TMDLs are scheduled.

Surface Water Quality Criteria

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Table 8: Class A Water Quality Criteria

Fecal Coliforms	100 organisms/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	21 degrees Celsius maximum or incremental increases above background
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

Class A surface waters normally have a temperature criterion of 18º C. However, WAC 173-201A-130(141) established a "special" classification of 21º C for this segment of the river, with the following modifying language:

> Temperature shall not exceed 21º C due to human activities. When natural conditions exceed 21º C no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3º C; nor shall such temperature increases, at any time, exceed t=34/ (T+9).

This criterion, and the impacts of the City's discharge to receiving water quality, is discussed further in the Temperature section of this fact sheet, on the following page.

As required by the previous permit, the City carried out a program of monitoring to characterize priority pollutants in the Yakima River. Ambient metals data and the associated water quality criteria are presented in the REASPOT.LXS spreadsheet and toxic organic compounds data are summarized in Appendix C. Pesticides were not detected in the receiving water samples.

Consideration of Surface Water Quality-Based Limits for Numeric Criteria

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows:

> The length of the chronic and acute mixing zones shall extend downstream no greater than 310 feet and 31 feet, respectively. The width of the chronic and acute mixing zones shall be no more than 50 feet wide.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

BOD_5-- Although the Lower Yakima River (segments downstream of the Yakima facility) is listed as water quality-impaired for DO on the current 303(d) list, it is not possible for Ecology to determine reasonable potential for the Yakima STP effluent to cause or contribute to this situation. Ecology used the Streeter-Phelps model to evaluate the need for water quality-based effluent limits for the draft permit. The State considers the Streeter-Phelps model to be a screening tool to determine whether additional analysis is necessary when an impact is indicated. The results of this model indicated that additional analysis is necessary. However, due to multiple point and non-point sources that also contribute to the DO problem in this area, the State cannot adequately model the Yakima STP effluent without accounting for the other discharges. Specifically, other downstream dischargers to the river include: nine municipal treatment plants, two industrial food processors, 10 agricultural return drains, and seven small tributary streams that receive agricultural runoff.

The waters of the return drains and streams carry oxygen-demanding pollutants from many non-point sources that have not been fully characterized or quantified by the State. Since the State has already identified the need for a DO TMDL to determine point source waste load allocations and non-point load allocations, Ecology believes that it would not be appropriate to set single facility waste load allocations because BOD is not a conservative pollutant and requires a comprehensive assessment of all contributing sources in the watershed to ensure the long-term health of the Yakima River. Additionally, the facility has technology-based effluent limits in the permit that will prohibit the facility from further impairment of the Yakima River. The final

permit will contain BOD effluent limitations based on the secondary treatment standards (a monthly average of 30 mg/L and weekly average of 45 mg/L).

Temperature--State regulations contain a special condition for this parameter, applicable from the mouth of the river to river mile 185.6, near Cle Elum. The special condition consists of a revision of the water quality criterion to 21 ^{o}C.

In addition to the 21 ^{o}C criterion, WAC 173-201A-130(141) describes two further criteria the City must satisfy to demonstrate compliance with the temperature criterion. They are:

> When natural conditions exceed 21 ^{o}C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3 ^{o}C; nor shall such temperature increases, at any time, exceed t = 34/ T 23.4 +9, t = 1.049.

'T' represents the background temperature, and "t" represents the maximum permissible temperature increase measured at the chronic mixing zone boundary.

The impact of the discharge on the temperature of the receiving water was modeled by simple mass-balance mixing analysis at critical condition. The maximum receiving water temperature recorded at the critical condition was 23.4 ^{o}C recorded in August of 2001 and the maximum effluent temperature was 25.9 ^{o}C recorded in September of 2003. The predicted resultant temperature at the boundary of the chronic mixing zone is 23.647 ^{o}C and the incremental rise is 0.247 ^{o}C, which is both below 0.3 ºC and t at 1.049 ºC.

The first condition, relating to the maximum 0.3 ^{o}C increase, applies to the City's discharge only when the maximum reported ambient temperature of 23.4 ºC is used. To be even more conservative with the model the maximum effluent temperature reported at 25.9 ºC was used.

The first condition, relating to the maximum 0.3 ^{o}C increase, would not apply to the City's discharge because the 90th percentile ambient temperature is 19.9 ^{o}C. Concerning the algorithmic condition, the maximum allowable increase then is calculated as follows:

$$t = 34/ (T+9)$$

$$t = 34/19.9+9)$$

$$t = 1.18$$

Using the mass-balance calculation and using the maximum effluent temperature of 25.9 ºC, the predicted incremental increase was determined to be 0.593 ^{o}C, which more than satisfies the condition.

This permit does not establish effluent limits based on the above scenarios. This permit requires the City to continue with the existing program of receiving water sampling for temperature and several other parameters. The goal of this receiving water monitoring is to collect site-specific data, upstream of the outfall, which can be used to evaluate impacts of the treatment plant's discharge on the receiving water. These data will be used to evaluate the need for temperature effluent limits at the next permit renewal.

Temperature and pH--The impact of pH and temperature were modeled using the calculations from EPA, 1988. The input variables were dilution factor 10.12:1, upstream temperature 19.9^{o}C, upstream pH 8.7, upstream alkalinity 43.4 (as mg $CaCO_3$/L), effluent temperature 25.9 ^{o}C, effluent pH of 5.87, effluent pH of 7.3, with an effluent alkalinity of 92.2 (as mg $CaCO_3$/L).

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology-based effluent limitation for pH was placed in the permit and temperature was not limited.

Fecal coliform-- The numbers of fecal coliform were modeled by simple mixing analysis using the 90th percentile of effluent data for July 2003-November 2006, of 71.2 organisms per 100 mL, and a dilution factor of 10.12. The 95th percentile receiving water concentration was 146 organisms per 100 mL. The mass balance calculation is presented in Appendix C.

Since 1999 there has only been one exceedance of the water quality standard for the segment of the river the Yakima facility discharges to therefore, the proposed permit limits will remain the same as in the current permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

Analysis of the effluent data in preparation of the current permit issued in 2003 found: Chlorine, Ammonia, Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Silver, Zinc, 11 organic compounds and two pesticides, Beta Endosulfon and Beta BHC. A reasonable potential analysis was conducted on these parameters to determine whether or not effluent limitations would be required in this permit. Copper, Lead, Silver and Zinc demonstrated reasonable potential to violate the water quality criteria. The 2003 permit required the City to conduct a Metals Study Assessment Report, which the City submitted with its application for permit renewal in 2006.

Table 5 (pg.13) contains a list of the toxic pollutants that were determined to be present in the 2003 to 2005 discharges. A reasonable potential analysis (See Appendix C) was conducted on

these parameters to determine whether or not effluent limitations would be required in this permit. Analysis of reasonable potential for each pollutant to exceed the water quality standards is explained in the following paragraphs. Pollutants are addressed by category: metals, ammonia, residual chlorine and the remaining priority pollutants.

Metals

The City reviewed its river and effluent hardness data against the hardness analyses conducted by three independent WET testing laboratories (AMEC/NAUTILUS, METRO and PARAMETRIX. The key finding of the review was that the Yakima lab may not have accurately characterized plant and river hardness between May 1997 and July 2004. The erroneous results generated by the Yakima lab may have been as great a 50% below the hardness present in the river and effluent. Consequentially, hardness-dependant reasonable potential determinations and the permit limits in effect under the current permit appear to be overly restrictive. Samples collected after August 2004 were split between the Yakima lab and Cascade Analytical and analyzed using procedure in the 2004-2006 Receiving Water and Effluent Study Quality Assurance Plan. Repeatability of the analysis between the labs has proven to be excellent. The City has requested that the metals limits be reexamined by Ecology to determine if metal limits are necessary in the proposed permit.

On December 6, 2005 the Department received a Revised Scope of Work for Metals Study and The Metals Study Assessment Report as required in Special Condition S13A and S13C of the current permit. The metals study presented data to substantiate the calculation of new metal translators, coefficients of variation and mixed hardness used for a determination of reasonable potential (See Appendix C). In the assessment the City used a more restrictive set of dilution factors based on an older data set than the Department used in establishing the dilution factors for the proposed permit. This in effect makes the reasonable potential determination even more conservative.

Based upon a determination of no reasonable potential for metals found in the Metals Study permit limits for metals in the proposed permit are not required.

Toxics

Ammonia and Chlorine was analyzed for reasonable potential to exceed the water quality criteria at the time the current permit was being written and no reasonable potential was found. However, limits that applied to the previous permit were continued because upgrades at the facility were not completed and a concern for violation of the anti-backsliding regulation. The most recent data (Table 4 pg.12) following completion of the upgrades shows reasonable potential to exceed the water quality criteria for residual chlorine but not for ammonia.

Residual chlorine concentrations have consistently been at or below the method detection limit of 6µg/L for the past three years. One excursion at 41µg/L occurred in August of 2005 that was

above the average weekly permit limit of 29µg/L. Because of this one excursion, there is Reasonable Potential for residual chlorine to exceed the water quality criteria with a coefficient of variation (C.V.) at 90%. New limits for residual chlorine based newly calculated dilution factors have been determined with the Departments Limits.xls spreadsheet at a default 60% C.V. They are 14.9µg/L average weekly and a maximum daily of 35.5µg/L.

Ammonia in the effluent did not exhibit reasonable potential to violate the water quality criteria. The analysis was conducted using the maximum ammonia concentration found in the past three years (Table 4 pg.12) following the facility plant upgrades. At 8.9mg ammonia/L no reasonable potential was determined. The 90th percentile for all three years is 3.1mg/L, less than half the maximum. The critical season maximum day is even lower at 1.76mg/L. Based on a no reasonable potential determination and the performance of the facility, no limit will be established for this permit term. Monitoring of ammonia will continue however to assure water quality is not threatened.

Toxic Organics

The previous permit required the City to implement a program characterizing toxic organic compounds in its effluent and the receiving water to gather data for the reasonable potential analysis in this permit. Data summarizing organic compounds detected in the City's 2003 and 1999 are contained in Appendix C for comparison.

The river was sampled for toxic organic compounds five times during the previous permit cycle, once per month from August through December 1999. For most of the samples analyzed, the practical quantitation level (PQL) was 0.4 µg/L. The overwhelming majority of the results were non-detects. Only pollutants with at least one detect are reported in the table (see appendix C). Generally, pollutants that were detected in the samples were present at a level between the MDL and the PQL; such pollutant concentrations are flagged as estimates in the lab reports.

September 1999 monitoring revealed no toxic organic compounds present in the sample. The October and December samples each indicated the presence of 1 compound and analysis of the November sample revealed the presence of 3 compounds. The majority of the “hits” listed in the table occurred in the August sample.

Next, a reasonable potential analysis was conducted to determine whether toxic organic compounds in the discharge are likely to cause violations of the surface water quality standards to protect aquatic life. None of the organic compounds found in 1999 in the City's effluent at the reported concentrations was predicted to exceed the water quality standards. Furthermore, the maximum effluent concentration reported for each compound is nearly always a fraction of the respective criteria. The only exceptions were bis-2-ethylhexyl phthalate and diethyl phthalate, for which dilution was sufficient to predict compliance. It should be noted that these organic compounds were present in the City's effluent at levels typical of a treatment plant in a City the size of Yakima's, and with the profile of industries discharging to the facility.

One of the base-neutral compounds, di-n-octal phthalate, was present in the discharge, but apparently there are no established criteria regulating this substance; therefore, the environmental impacts of this compound could not be evaluated. However, the impacts of this compound to the aquatic environment are at least partially evaluated through whole effluent toxicity (WET) testing, although it is one of an aggregate of all the toxic constituents in the discharge.

On the basis of the preceding narrative, the current permit contains neither effluent limits nor routine monitoring for any of the toxic organic compounds. However, the City is required to re-characterize its effluent for these compounds during this and the proposed permit cycle to collect enough data so that a reasonable potential analysis can be conducted again at the writing of the next permit in approximately 5 years. Furthermore, the City must abide by the whole effluent toxicity (WET) testing requirements of the proposed permit, which monitors the *aggregate* toxicity of the discharge.

The 2003 characterization of the effluent is found in Table 7 on page 15. Table 7 lists those organic compounds detected in the effluent. Only two compounds toluene and chloroform were detected. The 1999 characterization and the 2003 characterization are contained in Appendix C for ease of comparison. A reasonable potential determination for human health hazard determined no reasonable potential exits and therefore the proposed permit will not contain limits for the organic compounds.

Pesticides

The treatment plant's effluent was characterized for pesticides in June, August, September, October and November of 1999. The sampling program was focused in the fall because pesticides are most likely to be present in the wastewater during the fall fruit processing season. Samples were scrutinized for 24 common analytes. The only sample in which pesticides were found to be present was taken on September 14th. The results of this analysis were as follows:

Table 9: 1999 Analytical Results for Pesticides

Parameter	Units	Result	Quantitation Limit
Beta BHC	µg/L	0.124	0.050
Beta Endosulfan	µg/L	0.163	0.10

The determination of reasonable potential for pesticides in the effluent to exceed the aquatic water quality standards revealed that concentrations of Beta Endosulfan at the edges of the acute and chronic mixing zones were predicted to exceed the respective water quality criteria. The analysis showed no potential for Beta BHC to exceed the water quality criteria.

Effluent limits were not established for Beta Endosulfan because the treatment plant was undergoing upgrade. Furthermore it was reasoned, the final *Facility Plan* being developed by

the City would present an excellent opportunity for the City to evaluate the discharge after collecting more data and applying a more sophisticated water quality model than the rudimentary spreadsheets used by the Department.

The 2004 and 2005 effluent characterizations did not detect any pesticides including Beta Endosulfan, therefore no limit will be required.

TMDL Considerations

There is a Total Maximum Daily Load (TMDL) pending for the Lower Yakima River which may in addition to pH, dissolved oxygen, fecal coliform and pesticides include wasteload allocations for phosphorus, nitrogen or both. Phosphorous and nitrogen can be limiting factors in plant growth, which has a direct effect on pH in the water column. This phenomenon has the potential to affect the Permittee's discharge limitations at some time in the future. At this time it is unknown whether a wasteload allocation for phosphorus (P) or nitrogen (N) will be established for the Permittee's facility. Although there are no specific permit limitations regarding phosphorus or nitrogen in the permit at this time, the Permittee may wish to investigate means to reduce nutrient loading to the river in advance of any restrictions that may accompany the pending TMDL. Monitoring the final effluent for Phosphorus, Total Nitrogen and Ammonia will be required in the proposed permit.

Whole Effluent Toxicity

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC_{50}, EC_{50}, $IC_{25,}$ etc. All accredited labs have been provided the most

recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472 for a copy. Ecology recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

Summary of WET Testing Activities

The City submitted a summary report of all WET Testing that spans the previous and current permit cycle, from October 1997 to June of 2002. In 1997, the effluent failed to meet the chronic WET limits and accelerated testing was initiated. A toxicity identification/reduction evaluation (TI/RE) was initiated in July 1998 to determine the cause of toxicity. The TI/RE study plan prescribed a schedule of chronic toxicity that was concentrated in the summer and fall months to coincide with increased industrial discharges, a period when toxicity historically had been observed. The TI/RE progressed through 1998 and 1999; however due to intermittent toxicity, the test results were inconclusive.

For monitoring in 2000-2001, the Department issued Order No. DE 99WQ-C137, which required the City to return to routine acute and chronic WET Testing, but on a schedule concentrated in the summer and fall months. During this period, the effluent has been in compliance with the WET limits. A test in September 2001 indicated chronic toxicity above the CCEC limit. However, the Department determined the test result was 'anomalous' because the data did not fit the normal expected pattern of toxicity. Two accelerated tests conducted in October 2001 indicated some toxicity, but at levels meeting permit limits. Monitoring since issuance of the Order indicates a continuing seasonal trend of low-level toxicity (i. e., within permit limits, but measurable). Low-level toxicity in the discharge was found in samples taken in October and November 1999, September, November and December 2000, and November and December 2001. This seasonal toxicity coincides with the height of the fruit packing industry's discharge activities.

A plant performance review was initiated to look for possible correlations between toxicity and treatment plant performance. The results suggested that the plant was performing as expected and that there were no observable relationships between plant performance and toxicity.

The treatment plant's effluent has historically shown a seasonal pattern of toxicity. Increased toxicity has been observed in the fall and early winter months. This period coincides with relatively low treatment plant flows and relatively high production activity within the fruit packing industry, which represents a major industrial source of wastewater to the treatment plant. The TI/RE work conducted in 1998 and 1999 indicated that one of the toxicants was a short-lived organic compound fitting the profile of certain fungicides and biocides used by fruit packers (Parametrix, 1999). The short half-life of the toxicant, suggested by the TI/RE testing, implies that the toxicant will not persist in the receiving waters.

A source investigation of fruit packers and other industries was conducted in 1999 (Parametrix, 1999). The investigation determined that at least two apple packers were discharging wash water containing the fungicide thiabendazole (TBZ) at potentially toxic concentrations. Further efforts were made to correlate effluent toxicity with concentrations of TBZ and other fungicides and biocides present in the treatment plant effluent. However, because of the intermittent discharge practices of the fruit packing industry, the tests revealed a lack of toxicity when TBZ and other fungicides were undetected in the effluent.

Following the source investigation, the City required the two fruit packers to discontinue discharging their TBZ drench tanks to the sanitary sewer. The City also informed other fruit packers of the same stipulation on TBZ.

WET Limits

Acute Toxicity

In past tests, acute toxicity was found to be present at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. An acute toxicity limit was established in the previous permit. The acute toxicity limit was set relative to the zone of acute criteria exceedance (acute mixing zone) established in accordance with WAC 173-201A-100. The acute critical effluent concentration (ACEC) is the concentration of effluent existing at the boundary of the acute mixing zone during critical conditions. The acute toxicity limit was no statistically significant difference in test organism survival between the ACEC, 66.2% of the effluent, and the control.

The City has not had any acute toxicity found in its effluent since November 1997. Therefore, the acute WET limit established in the previous permit, is not contained in the current and proposed permit. The City is required to continue monitoring its discharge for acute toxicity in part to supplement chronic WET testing in the fall when toxicity is likely. Rapid 48 hour *Ceriodaphnia dubia* WET testing will be **required twice a month during the months of August, September and October, when fruit processing dischargers are in operation**. The results of the testing will be required to be submitted by the Permittee annually. If toxicity is reoccurring the Department may require TI/RE work is conducted by administrative order, permit modification or at the time of permit reissuance.

Chronic Toxicity

In past tests, chronic toxicity was found to be present at levels that, in accordance with WAC 173-205-050(2)(a), have a reasonable potential to cause receiving water toxicity. A chronic toxicity limit was established in the current permit. The chronic toxicity limit is set relative to the mixing zone established in accordance with WAC 173-201A-100. The chronic critical effluent concentration (CCEC) is the concentration of effluent existing at the boundary of the mixing zone during critical conditions. **The chronic toxicity limit is no statistically significant**

difference in test organism response between the CCEC, 9.88% of the effluent, and the control.

Monitoring for compliance with a chronic toxicity limit is accomplished by conducting a chronic toxicity test using a sample of effluent diluted to equal the CCEC and comparing test organism response in the CCEC to organism response in nontoxic control water. **The Permittee is in compliance with the chronic toxicity limit if there is no statistically significant difference in test organism response between the CCEC and the control.**

Yakima had significant chronic WET toxicity at the ACEC (66.2% effluent) in October 2000 and 2002, September 2003 and November 2003. The September 2003 test presented toxicity at the CCEC (dilution at the edge of the chronic mixing zone) as well. The Department has determined that a chronic WET limit is still needed. The seasonality of the toxicity is obvious. The September 2003 test result failed to meet the chronic WET limit, but there was some confusion at the time over reliability of the result. Follow up testing showed control survivability and reproduction was robust. There was no difference between filtered and unfiltered samples indicating that a pathogen may not have been involved, which previously was thought to be the cause of an anomalous test. With both filtered and non-filtered tests the concentration-response for survival was consistent with a relatively short exposure at lethal concentrations of a relatively slow acting toxicant.

In recognition of the City's efforts during the previous permit cycle to reduce and prevent introduction of toxic substances into its treatment works and increased, targeted acute testing in the fall, the sampling frequency for chronic toxicity is reduced from three times annually to two times annually, once in the summer or early fall, when fruit processors are discharging to the City, and once in the winter. The Department believes that the above chronic testing in conjunction with acute testing at five dilutions twice a month in August, September and October will be the most cost effective means of determining if transient toxicity remains a problem for the City and identifying industrial sources if need be.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard". The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

Human Health

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination indicated the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted,

Sediment Quality

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY LIMITATIONS

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has no discharge to ground and therefore no limitations are required based on potential effects to ground water.

PERMIT LIMITATIONS

The effluent limitations for the proposed permit are contained in the table 10 below.

Table 10
Comparison Of Effluent Limits With The Existing Permit Issued 2003

Parameter	**Existing Limits**		**Proposed Limits**	
5-day Biochemical Oxygen Demand (BOD_5)	30 mg/L Ave. Month 45 mg/L Maximum Week		30 mg/L Ave. Month 45 mg/L Max. Week	
Total Suspended Solids (TSS)	30 mg/L Average Month 45 mg/L Max. Week		30 mg/L Ave. Month 45 mg/L Max. Week	
Parameter	**Existing Limits**		**Proposed Limits**	
Fecal Coliform Bacteria	200 Avg. Month 400 Max. Week		200 Avg. Month 400 Max. Week	
pH	Between 6.0 and 9.0 at all times.			
Parameter	**Max. Month**	**Max. Week**	**Max. Month**	**Max. Week**
Total Residual Chlorine (TRC)	0.012 mg/L	0.029 mg/L	0.015 mg/L	0.036 mg/L
Total Ammonia, as N	4.6 mg/L	12.3 mg/L	NA [1]	NA
Total Copper	9.84 µg/L	14.36 µg/L	NA	NA
Total Lead	3.96 µg/L	5.77 µg/L	NA	NA
Total Silver	2.18 µg/L	3.17 µg/L	NA	NA
Total Zinc	70.35 µg/L	95.82 µg/L	NA	NA
Chronic WET Limit	[2]		[3]	

1 "NA" means Not Applicable.

[2] The chronic toxicity limit shall be no statistically significant difference in test organism response between the chronic critical effluent concentration (CCEC), 9.88% of the effluent, and the control. Percent change in the CCEC represents a recalculation based on new dilution factors derived from new approved Yakima River flow data.

MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved. The schedule for the routine monitoring of influent and effluent parameters is detailed in this permit under Special Condition S2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 1994) for activated sludge plants with a design flow of greater than 5 MGD (pp. XIII-43).

Given the profile of industries discharging to the POTW, the large size of the treatment plant, and the City's fully delegated pretreatment status; this permit contains an extensive monitoring program of conventional and non-conventional pollutants, priority pollutants scans, WET Testing and receiving water sampling. Specifically, State and Federal regulations require (1) routine monitoring of conventional and toxic substances in the influent and effluent, (2) priority pollutant monitoring associated with the pretreatment program, (3) effluent and receiving water

monitoring of metals to collect data for future reasonable potential determinations, and (4) WET Testing.

Monitoring for BOD, TSS, TKN and Flow is being required to further characterize the domestic influent.

Monitoring for BOD, TSS, TKN and Flow is being required to further characterize the industrial influent.

Monitoring for BOD, TSS, Total Nitrogen, Ammonia, Phosphate, Residual Chlorine, Sulfites, Fecal Coliform Bacteria, Dissolved Oxygen, pH, Alkalinity, Temperature and Flow is being required to further characterize the effluent. Monitoring of sulfite has been reduced from 3 per week to once per week due to consistent values, over the last three years below the method level of detection.

Acute WET Testing via the rapid screening method is required in the proposed permit cycle according to the schedule outlined in condition S.9 of the permit.

Chronic toxicity in the effluent at the Yakima facility was observed in 2002 and 2003 and therefore WET testing for chronic toxicity will be continued in the proposed permit according to the schedule outlined in condition S.10 of the permit. The City is strongly encouraged to coordinate discrete sampling events, whenever possible, to allow the correlation of data to the maximum degree possible. For instance, coordinating the timing of the annual influent priority pollutant scan associated with the pretreatment requirements may be very useful in identifying sources of intermittent toxicity. If the WET Test fails, a priority pollutant scan taken concurrently could help determine the cause of the noncompliance.

As a pretreatment POTW, the City of Yakima is required to have influent, final effluent, and sludge sampled for toxic pollutants in order to characterize the industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass through the plant to the sludge or the receiving water. The monitoring data will be used by Yakima to develop or modify local limits, which commercial and industrial users must meet.

The sprayfield will be monitored in accordance with the approved Sampling and Analysis Plan, which is contained in Appendix C of the O&M Manual.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required

monitoring frequency is consistent with agency guidance given in the current version of Ecology's *Permit Writer's Manual* (July 2004) for a municipal treatment facility with a discharge over 5 million gallons per day.

LAB ACCREDITATION

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for:

Table 11: Yakima POTW Laboratory Accredited Parameters

General Chemistry	Trace Metals	Trace Metals	Microbiology
Alkalinity	Antimony	Manganese	Fecal Coliforms
Ammonia	Arsenic	Mercury	Total Coliforms
BOD/CBOD	Beryllium	Molybdenum	
Chloride	Cadmium	Nickel	
Residual Chlorine	Calcium	Potassium	
DO	Chromium	Selenium	
Hardness	Copper	Silver	
Ph	Iron	Sodium	
TSS	Lead	Thallium	
Sulfite	Magnesium	Zinc	
Hexane Extractable Material			

In the current permit fact sheet the City laboratory is listed as accredited for organic analysis. The City has since found it more cost effective to contract organic analysis to outside accredited laboratories rather than maintain in-house accreditation and has allowed the accreditation to lapse.

OTHER PERMIT CONDITIONS

REPORTING AND RECORDKEEPING

The conditions of S3. are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

PREVENTION OF FACILITY OVERLOADING

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4. to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4. restricts the amount of flow.

OPERATION AND MAINTENANCE (O&M)

The proposed permit contains condition S.5. as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment.

RESIDUAL SOLIDS HANDLING

To prevent water quality problems the Permittee is required in permit condition S7. to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503, and by Ecology under Chapter 70.95J RCW, Chapter 173-308 WAC "Biosolids Management", and Chapter 173-350 WAC "Solid Waste Handling Standards". The disposal of other solid waste is under the jurisdiction of the Yakima County Health Department.

Biosolids will be managed in accordance with the Final Coverage granted under the Statewide General Permit for Biosolids Management.

PRETREATMENT

To provide more direct and effective control of pollutants discharged, the City of Yakima has been delegated permitting, monitoring and enforcement authority for industrial users discharging to its treatment system. Delegation authority was granted on June 15, 2003. The Department oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC).

According to the most recent NPDES permit application submitted to the Department, the POTW receives discharges from 22 non-categorical Significant Industrial Users (SIUs) and 3 Categorical Industrial Users (CIUs) from industries located within the City. City of Yakima has full pretreatment authority.

The Department received the City's application for full pretreatment authority on June 30, 2000. The application is organized in 5 sections, or exhibits. Each section is described in the cover letter as follows:

1. A statement of legal authority for the City to administer the pretreatment program, the Sewer Use Ordinance which the City will use to regulate dischargers, the 'Master State Waste Discharge Permit Shell' from which the City will develop permits, and the relevant interlocal agreements and a determination of their adequacy;
2. A letter from the City Attorney describing the manner in which the pretreatment program will be administered;
3. A description of the City Wastewater Division responsible for implementing the pretreatment program, including staffing and funding levels;
4. A description of the City's technically-based local pretreatment limits; and,
5. The results of the City's Industrial User Survey.

The application was evaluated utilizing the EPA guidance document, Procedures Manual for Reviewing a POTW Pretreatment Program Submission, dated October 1983. The application was assembled by Preston, Gates and Ellis and appeared to be complete. The Department's review of the application indicated the main elements to be present; however, the adequacy of each element was not rigorously evaluated due to resource constraints. Similar to the review of an engineering document, the Department assumes that the City's legal consultants have included the necessary elements to allow successful implementation of the pretreatment program, and the Department lacks the resources to evaluate the complex details of the various inter-local agreements. Therefore, the Department on June 15, 2003 approved the application and the current permit formally authorized the City to implement its local pretreatment program.
An industrial user survey is required to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with Federal pretreatment regulations (40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act), with State regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances. The survey is required as part of the annual pretreatment report.

As sufficient data becomes available, the Permittee shall, in consultation with the Department, reevaluate its local limits in order to prevent pass through or interference. Upon determination by the Department that any pollutant present causes pass through or interference, or exceeds established sludge standards, the Permittee shall establish new local limits or revise existing local limits as required by 40 CFR 403.5. In addition, the Department may require revision or establishment of local limits for any pollutant that causes an exceedance of the Water Quality Standards or established effluent limits, or that causes whole effluent toxicity. The determination by the Department shall be in the form of an Administrative Order. In order to develop these local limits, the Department will provide environmental criteria or limits for the various pollutants of concern.

The Department may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern. Any permit modification is subject to formal due process procedures pursuant to State and Federal law and regulation.

SPILL PLAN

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan as needed and submit updates to the Department.

OUTFALL EVALUATION

Proposed permit condition S.11 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. The Department proposes that this permit be issued for 5 years.

REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA)

1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.

1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.

1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

Metcalf and Eddy.

1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology.

Laws and Regulations(http://www.ecy.wa.gov/laws-rules/index.html)

Permit and Wastewater Related Information
(http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Washington State Department of Ecology.

1994. Permit Writer's Manual. Publication Number 92-109

Water Pollution Control Federation.

1976. Chlorination of Wastewater.

Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public Notice of Draft (PNOD) was published on April 21, 2006 in the Yakima Herald to inform the public that an application, draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Coordinator
Department of Ecology
Central Regional Office
15 West Yakima Avenue, Suite 200
Yakima, WA 98902

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30 day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, 509/457-7105, or by writing to the address listed above.

This permit and fact sheet were written by Richard Marcley.

APPENDIX B--GLOSSARY

Acute Toxicity--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

Average Monthly Discharge Limitation --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

Average Weekly Discharge Limitation -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

CBOD5 – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD5 is given in 40 CFR Part 136.

Chlorine--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

Chronic Toxicity--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Combined Sewer Overflow (CSO)--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots).

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

Industrial User-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

Infiltration and Inflow (I/I)--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

Interference -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

Pass through -- A discharge which exits the POTW into waters of the State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Potential Significant Industrial User--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;

b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

Quantitation Level (QL)-- A calculated value five times the MDL (method detection level).

Significant Industrial User (SIU)--

1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;

2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality-based Effluent Limit--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

APPENDIX C--TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at (http://www.ecy.wa.gov/programs/wq/wastewater/index.html

Mass balance spreadsheet uses the following formula:

Acute Mass Balance Dilution Model
2.5% of 835 CFS

CHRONIC DILUTION					potential
eff. flow csf	effluent mg/L	river flow csf	river mglL	final conc	dil factor
24.361		20.875		0.000	1.86

Based on Max Day in 3 years Sept 2003

Chronic Mass Balance Dilution Model
25% of 835 CSF

CHRONIC DILUTION					potential
eff. flow csf	effluent mg/L	river flow csf	river mg/L	final conc	dil factor
22.886		208.75		0.000	10.1

Based on Max Month in 3 years Sept 2003

Calculation Of Ammonia Concentration and Criteria for fresh water. Based on EPA Quality Criteria for Water (EPA 400/5-86-001) and WAC 173-201A. Revised 1-5-94 (corrected total ammonia criterion). Revised 3/10/95 to calculate chronic criteria in accordance with EPA Memorandum from Heber to WQ Stds Coordinators dated July 30, 1992.

INPUT	
1. Ambient Temperature (deg C; 0<T<30)	19.9
2. Ambient pH (6.5<pH<9.0)	7.49
3. Acute TCAP (Salmonids present- 20; absent- 25)	20
4. Chronic TCAP (Salmonids present- 15; absent- 20)	15
OUTPUT	
1. Intermediate Calculations:	
Acute FT	1.01
Chronic FT	1.41
FPH	1.45
RATIO	18
pKa	9.40
Fraction Of Total Ammonia Present As Un-ionized	1.2039%
2. Un-ionized Ammonia Criteria	
Acute (1-hour) Un-ionized Ammonia Criterion (ug NH3/L)	178.0
Chronic (4-day) Un-ionized Ammonia Criterion (ug NH3/L)	21.6
3. Total Ammonia Criteria:	
Acute Total Ammonia Criterion (mg NH3+ NH4/L)	14.8
Chronic Total Ammonia Criterion (mg NH3+ NH4/L)	1.8
4. Total Ammonia Criteria expressed as Nitrogen:	
Acute Ammonia Criterion as mg N	12.2
Chronic Ammonia Criterion as N	1.47

	YAKIMA RIVER RECEIVING WATER STUDY Conducted by yakima STP			
DATE	TEMPERATURE DEGREES CELCIUS	ALKALINITY mg/L CaCO3	pH	AMMONIA mg/L as N
9/8/2004	15.00	42.5	7.56	0.0781
10/6/2004	15.20	65.0	7.74	0.0668
11/3/2004	6.90	55.0	7.72	0.0477
12/2/2004	2.60	50.0	7.79	0.307
1/5/2005	0.30	55.0	7.43	0.0179
2/3/2005	4.00	45.0	7.31	0.0462
3/1/2005	6.40	55.0	8.18	0.0372
4/5/2005	7.70	50.0	7.69	0.0396
5/3/2005	11.30	40.0	7.31	0.579
6/2/2005	13.50	45.0	7.69	0.283
7/7/2005	17.40	43.0	7.55	0.06
8/2/2005	18.50	43.0	7.50	0.0556
9/12/2005	15.10	45.0	7.63	0.0568
10/11/2005	11.30	50.0	6.98	0.046
11/9/2005	3.80	60.0	7.40	0.0589
12/8/2005	0.20	55.0	7.48	0.0936
1/5/2006	2.50	55.0	7.39	0.069

AMMONIA & RESIDUAL CHLORINE REASONABLE POTENTIAL CALCULATION

REASONABLE POTENTIAL CALCULATIONS

This spreadsheet calculates the reasonable potential to exceed state water quality standards for a small number of samples. The procedure and calculations are done per the procedure in Technical Support Document for Water Quality-based Toxics Control, U.S. EPA, March, 1991 (EPA/505/2-90-001) on page 56. User input columns are shown with red headings. Corrected formulas in col G and H, on 5/98 (GB)

				State Water Quality Standard		Max concentration at edge of...										
Parameter	Metal Criteria Translator as decimal	Metal Criteria Translator as decimal	Ambient Conc (metals as dissolved)	Acute	Chronic	Acute Mixing Zone	Chronic Mixing Zone	LIMIT REQ'D?	Effluent percentile value		Max effluent conc. measured (metals as total recoverable)	Coeff Variation		# of samp	Multiplier	Acute Dil'n Factor	Chronic Dil'n Factor
Parameter	Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	*ug/L*	*ug/L*			*Pn*	*ug/L*	*CV*	*s*	*n*			
CHLORINE (Total Residual) 7782505			0.0000	19.00	11.00	29.89	5.32	**YES**	0.95	0.902	41.00	0.90	0.77	29	1.31	1.80	10.12
AMMONIA Max Day	0.95	0.95	292.0	12200.0	1470.0	5822.73	1275.73	**NO**	0.95	0.902	8870.00	0.60	0.55	29	1.22	1.80	10.12
AMMONIA Max Avg Month	0.95	0.95	292.0	12200.0	1470.0	938.47	406.99	**NO**	0.95	0.902	1260.00	0.60	0.55	29	1.22	1.80	10.12

HUMAN HEALTH WATER QUALITY CRITERIA REASONABLE POTENTIAL @ ACUTE DILUTION FACTOR

REASONABLE POTENTIAL TO VIOLATE HUMAN HEALTH WATER QUALITY CRITERIA

Revised 3/00																
	Ambient Concentration (Geometric Mean)	Water Quality Criteria for Protection of Human Health	Max concentration at edge of chronic mixing zone.	LIMIT REQ'D?	Expected Number of Compliance Samples per Month	AVERAGE MONTHLY EFFLUENT LIMIT	MAXIMUM DAILY EFFLUENT LIMIT	Estimated Percentile at 95% Confidence		Max effluent conc. measured	Coeff Variation		# of samples from which # in col. K was taken	Multiplier	AVG USED INSTEAD of Calculated 50th percentile Effluent Conc. (When n>10)	Dilution Factor
Parameter	*ug/L*	*ug/L*	*ug/L*			*ug/L*	*ug/L*		*Pn*	*ug/L*	*CV*	**S**	*n*			
Chloroform		5.70	1.15	**NO**	**0.02**	**NONE**	**NONE**	0.50	0.37	3.46	0.60	0.6	3	1.20	2.14	1.9
Tolulene		6800.00	0.81	**NO**	**0.02**	**NONE**	**NONE**	0.50	0.37	2.54	0.60	0.6	3	1.20	1.51	1.9

Calculation of the New Residual Chlorine Limit

Dilution (Dil'n) factor is the inverse of the percent effluent concentration at the edge of the acute or chronic mixing zone.

Permit Limit Calculation Summary										Waste Load Allocation (WLA) and Long Term Average (LTA) Calculations							Statistical variables for permit limit calculation				
Acute Dil'n Factor	Chronic Dil'n Factor	Metal Criteria Translator	Metal Criteria Translator	Ambient Concentration	Water Quality Standard Acute	Water Quality Standard Chronic	Average Monthly Limit (AML)	Maximum Daily Limit (MDL)	Comments	WLA Acute	WLA Chronic	LTA Acute	LTA Chronic	LTA Coeff. Var. (CV)	LTA Prob'y Basis	Limiting LTA	Coeff. Var. (CV)	AML Prob'y Basis	MDL Prob'y Basis	# of Samples per Month	
		Acute	Chronic	*ug/L*	*ug/L*	*ug/L*	ug/L	ug/L		*ug/L*	*ug/L*	*ug/L*	*ug/L*	*decimal*	*decimal*	*ug/L*	*decimal*	*decimal*	*decimal*	*n*	
1.9	10.12				19.0000	11.0000	**14.9**	**35.5**		35	111.32	11.3	58.7	0.60	0.99	11.3	0.60	0.95	0.99	12.00	1.00

Dept. of Ecology EAP Data from NOB HILL Station 1994 through 2004 During Critical Season July, August and September
Dates and Numbers in Bold are from Yakima STP Receiving Water Study

date	FC (#/100ml)	FLOW (CFS)	Ammonia (mg/L)	Nitrate Nitrite (mg/L)	Dissolved P (mg/L)	OXYGEN (mg/L)	PH (pH)	TSS (mg/L)	TEMP (deg C)	Total Phos (mg/L)	Total Nitrogen (mg/L)	TURB (NTU
7/7/2005									**17.40**			
8/2/2005									**18.50**			
9/12/2005									**15.10**			
7/14/2004	87		0.011	0.177	0.021	10	8.25	11	18	0.0293	0.271	4
8/4/2004	10		0.114	0.023		10.1	8.73	9	21.2	0.0279	0.19	2.9
9/8/2004									**15.00**			
9/15/2004	22		0.105	0.025		11.17	8.66	6	16.1	0.0361	0.2	3.2
7/9/2003	14	3410	0.01	0.11	0.021	11.37	8.86	8	18	0.034*	0.21	3.8
8/6/2003	150	3770	0.01	0.128	0.019	9.94	8.32	10	19.7	0.036*	0.23	3.1
9/10/2003	29	2420	0.01	0.097	0.027	10.76	8.43	10	15.6	0.044*	0.17	5
7/8/2002	45	4160	0.01	0.138	0.013	10.19	8.19	6	16.6	0.026*	0.215	3.2
8/5/2002	23	3830	0.01	0.137	0.018	10.7	7.98	7	14.6	0.038*	0.214	2.9
9/9/2002	27	2830	0.01	0.108	0.0322	10.8	8.2	12	15.1	0.053*	0.172	5.6
7/9/2001	86	2680	0.017	0.137	0.024	10.07	8.46	11	20.2	0.034*	0.245	4.6
8/13/2001	18	2750	0.01	0.065	0.014	9.89	8.66	8	23.4	0.027*	0.154	2.7
9/3/2001	28	2540	0.01	0.059	0.014	10.39	8.5	6	18.3	0.029*	0.132	2.8
7/12/2000	31	3780	0.01	0.105	0.013	10.7	9.2	7	15.3	0.026*	0.2	2.9
8/16/2000	9	3560	0.01	0.103	0.016	10.19	8.21	7	17.4	0.035*	0.189	3.3
9/6/2000	23	2840	0.01	0.081	0.019	10.3	8.11	4	13.4	0.038*	0.185	3.5
7/7/1999	17	5850	0.025	0.076	0.017	10	7.8	13	15.6		0.046*	0.152
8/4/1999	44	3750	0.031	0.082	0.016	10	8.3	6	15.7		0.037*	0.196
9/8/1999	21	2900	0.062	0.146	0.027	11.1	8.2	16	12.2		0.071*	0.222
7/15/1998	140	3720	0.01	0.141	0.023	9.6	8.1	18	15.1	0.038	0.231	7.5
8/12/1998	71	3120	0.01	0.13	0.013	9.2	8.2	20	18.6	0.022	0.249	3.9
9/9/1998	110	3010	0.01	0.097	0.025	9.2	8	18	16.3	0.071	0.235	13
7/15/1997		4420	0.01	0.124	0.024	10.8	8.7	8	18.2	0.032	0.218	3
8/13/1997	29	4060	0.01	1.3	0.069	10.5	8.4	25	19.9	0.122	1.51	9.2
9/16/1997	40	2870	0.01	0.178	0.017	11.2	8.4	5	12.5	0.059	0.251	3
7/16/1996	46	3780	0.01	0.104	0.013	8.6	7.6	20	16.3	0.017	0.239	6.7
8/12/1996	62	3640	0.01	0.105	0.01	9.8	8.4	11	17	0.037	0.173	6.3
9/9/1996	170	3200	0.01	0.129	0.021	9.6	8	30	14.5	0.066	0.242	22
7/11/1995	64	3940	0.022	0.172	0.02	9.9	8.3	14	14.2	0.049	0.391	6
8/15/1995	32	3410	0.016	0.13	0.019	9.2	8.3	12	16.2	0.031	0.256	4
9/12/1995	36	2900	0.014	0.132	0.022	9.1	8.1	19	15.4	0.061	0.298	12
AVG	51.17	3449.63	0.02	0.15	0.02	10.15	8.32	11.90	16.63	0.05	0.27	5.02
MAX	170.00	5850.00	0.11	1.30	0.07	11.37	9.20	30.00	23.40	0.12	1.51	22.00
90th	116.00	4100.00	0.03	0.17	0.03	11.11	8.70	20.00	19.90	0.07	0.28	9.48

Temperature Rise Predictions at Edge of Chronic Mixing Zone

Maximum reported effluent and ambient temperatures worst case scenario:

	Chronic Mass Balance Dilution Model				
		25% of 835 CSF			
CHRONIC DILUTION					potential
eff. flow csf	effluent ° C	river flow csf	Ambient° C	Final Temp	dil factor
22.886	25.9	208.75	23.4	23.647	10.12
Allowed Temp Rise ° C when is Ambient over 21° C < 0.3 or (t=34/(T+9)) = 1.049					
Based on Max Month in 3 years Sept 2003			Temp Rise 0.247 < 0.3 and 1.049		

90^{th} percentile ambient temperature modeled with maximum reported effluent temperature:

	Chronic Mass Balance Dilution Model				
		25% of 835 CSF			
CHRONIC DILUTION					potential
eff. flow csf	effluent ° C	river flow csf	Ambient° C	Final Temp	dil factor
22.886	25.9	208.75	19.9	20.493	10.12
Allowed Temp Rise ° C when is Ambient under 21° C < (t=34/(T+9)) = 1.176					
Based on Max Month in 3 years Sept 2003			Temp Rise 0.593 < 1.176		

	Chronic Mass Balance Dilution Model				
		25% of 835 CSF	Fecal Coliform	Monthly	
CHRONIC DILUTION					potential
eff. flow csf	Colonies 90th Percentile	river flow csf	Ambient colonies 90th Precentile	Final Colonies	dil factor
22.886	71.2	208.75	116	111.574	10.12

YAKIMA TEMP EFLUENT DATA		
	Avg Mo° C	Max Day ° C
1-Jul-03	23.3	25.4
1-Aug-03	23.1	23.9
1-Sep-03	22.5	25.9
1-Jul-04	23	24.4
1-Aug-04	22.5	24.4
1-Sep-04	21.5	22.5
1-Jul-05	23.3	24.9
1-Aug-05	23.3	24.8
1-Sep-05	21.5	22.6
AVG	22.7	24.3
MAX	23.3	25.9
90th	23.3	25.5

Calculation of pH of a mixture of two flows. Based on the procedure in EPA's DESCON program (EPA, 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington D.C.)

Based on Lotus File PHMIX2.WK1 Revised 19-Oct-93

INPUT	Effluent @ Max pH	Effluent @ Min pH
1. DILUTION FACTOR AT CHRONIC MIXING ZONE BOUNDARY	10.120	10.120
1. UPSTREAM/BACKGROUND CHARACTERISTICS		
Temperature (deg C):	19.90	19.90
pH:	8.70	8.70
Alkalinity (mg CaCO3/L): Yakima Receiving Water Study Critical Season Average	43.40	43.40
2. EFFLUENT CHARACTERISTICS		
Temperature (deg C): Maximum report temperature	25.90	25.90
pH:	7.30	5.87
Alkalinity (mg CaCO3/L): 90th Percentile	92.20	92.20
OUTPUT		
1. IONIZATION CONSTANTS		
Upstream/Background pKa:	6.38	6.38
Effluent pKa:	6.34	6.34
2. IONIZATION FRACTIONS		
Upstream/Background Ionization Fraction:	1.00	1.00
Effluent Ionization Fraction:	0.90	0.25
3. TOTAL INORGANIC CARBON		
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	43.61	43.61
Effluent Total Inorganic Carbon (mg CaCO3/L):	102.42	367.37
4. CONDITIONS AT MIXING ZONE BOUNDARY		
Temperature (deg C):	20.49	20.49
Alkalinity (mg CaCO3/L):	48.22	48.22
Total Inorganic Carbon (mg CaCO3/L):	49.42	75.60
pKa:	6.38	6.38
pH at Mixing Zone Boundary:	7.98	6.62

City of Yakima Metals Study Basis for Establishment of Dilution Values Used in the Reasonable Potential and Water Quality Criteria Calculations.

	2.50%	25%								
7Q10	acute river	chronic river	acute	acute	chronic	chronic	acute	chronic	ACUTE	CHRONIC
river, cfs	allowed,cfs	allowed, cfs	effluent,gpd	effluent,cfs	effluent, gpd	effluent, cfs	% effluent	% effluent	DIL FAC.	DIL.FAC.
835	20.88	208.75	20,000,000	30.95	18,300,000	28.32	59.7	11.9	1.67	8.37

7Q10, ACUTE EFFLUENT FLOW, AND CHRONIC EFFLUENT FLOW FROM
Appendix F, Draft 2004 Wastewater Facility Plan, Black & Veatch, February 2004

[1]7Q10, ACUTE EFFLUENT FLOW, AND CHRONIC EFFLUENT FLOW FROM
Appendix F, Draft 2004 Wastewater Facility Plan, Black & Veatch, February 2004

Table 7
Metals Water Quality Criteria at Acute Mixed Hardness and at Chronic Mixed Hardness

Hardness Simple Mixing Analysis	
Effluent Hardness =	63.1
Acute Dilution Factor =	1.67
Ambient Hardness =	35.3
Acute Hardness =	51.90
Effluent Hardness =	63.1
Chronic Dilution Factor =	8.37
Ambient Hardness =	35.3
Chronic Hardness =	38.62

		STATE OF WASHINGTON WATER QUALITY CRITERIA				
		Acute Hardness	Chronic Hardness			
	Hardness =	51.90	38.62	mg/L as $CaCO_3$		
		Surface Water Criteria, ug/L				
		Dissolved Criteria			Total Recoverable Criteria	
#	Parameter	Acute	Chronic		Acute	Chronic
1	Arsenic	360	190		360	190
2	Cadmium	1.82	0.510		1.87	0.537
3	Chromium (Hex)	15	10		15.3	10.4
4	Chromium (Tri)	321	81.7		1,015	95.0
5	Copper	9.17	5.03		9.56	5.24
6	Iron	—	—		—	—
7	Lead	31.4	0.881		35.4	0.9
8	Manganese	—	—		—	—
9	Mercury	2.10	0.012		2.47	0.012
10	Nickel	813	70.3		814	70.5
11	Selenium	—	—		20.0	5.00
12	Silver	1.12	—		1.31	—
13	Zinc	65.7	46.7		67.1	47.3

EFFLUENT		RECEIVING WATER	
[1,2]DATE	HARDNESS, mg/L CaCO3	DATE	HARDNESS, mg/L CaCO3
8/6/2003	88.0	3/1/2004	40.7
9/2/2003	124.0	4/1/2004	39.6
9/4/2003	92.0	7/19/2004	34.8
9/6/2003	84.0	7/26/2004	40.4
9/23/2003	72.0	8/20/2004	44.0
9/25/2003	100.0	9/8/2004	40.4
9/27/2003	124.0	11/3/2004	45.8
10/2/200	76.0	12/2/2004	46.3
11/4/2003	64.0	1/5/2005	49.7
11/6/2003	80.0	2/3/2005	40.9
11/7/2003	88.0	3/1/2005	46.0
3/23/2004	72.0	3/11/2005	47.2
3/25/2004	84.0	3/18/2005	43.4
3/29/2004	108.0	3/25/2005	45.5
8/20/2004	74.0	4/1/2005	45.0
9/8/2004	69.5	4/5/2005	45.5
10/6/2004	70.2	4/15/2005	43.5
11/3/2004	68.4	4/22/2005	45.3
12/2/2004	68.1	4/29/2005	36.8
12/22/2004	74.7	5/3/2005	38.0
12/30/2004	82.6	5/13/2005	37.5
1/5/2005	75.1	6/2/2005	39.8
1/11/2005	82.9	6/24/2005	35.0
1/21/2005	83.5	7/1/2005	35.5
1/29/2005	79.3	7/7/2005	35.6
2/3/2005	81.7	7/15/2005	35.0
3/1/2005	76.6	8/3/2005	34.0
4/1/2005	75.0	9/12/2005	36.4
4/5/2005	70.0	10/18/2005	48.8
4/15/2005	69.0		
4/22/2005	64.8		
5/3/2005	67.5		
5/4/2005	71.4		
5/9/2005	65.0		
5/13/2005	77.5		
5/15/2005	67.5		
5/17/2005	70.7		
5/19/2005	76.2		
5/22/2005	73.8		
5/23/2005	72.5		
5/24/2005	64.3		
6/2/2005	66.5		
6/12/2005	72.5		
9/9/2005	65.6		
10/8/2005	73.3		
COUNT	45	COUNT	29
MINIMUM	64.0	MINIMUM	34
MAXIMUM	124	MAXIMUM	49.7
10TH PERCENTILE	63.1	10TH PERCENTILE	35.3

[1]TABULATED EFFLUENT HARDNESS VALUES FOR 8/6/2003 THROUGH 3/29/2004 WERE GENERATED BY WHOLE EFFLUENT TOXICITY TESTING LABORATORIES AND REPLACE ERRONEOUS YRWWTP HARDNESS MEASUREMENTS REPORTED ON YRWWTP DMRs.
[2]EFFLUENT HARDNESS MEASUREMENTS TAKEN DURING MAGNESIUM HYDROXIDE PILOT STUDY AFTER 6/16/05 ARE NOT TABULATED.

METALS TRANSLATORS

	EFFLUENT COPPER			EFFLUENT LEAD			EFFLUENT SILVER			
DATE	**TOTAL**	**DISSOLVED**	**Ln(DISSOLVED/TOTAL)**	**TOTAL**	**DISSOLVED**	**Ln(DISSOLVED/TOTAL)**	**TOTAL**	**DISSOLVED**	**Ln(DISSOLVED/TOTAL)**	**TOTAL**
6/4/2003	6.38	5.47	-0.154	0.608	0.508	-0.180	0.432	0.144	-1.099	46
9/8/2004	5.45	4.88	-0.110	0.365	0.326	-0.113	0.122	0.032	-1.338	47.7
10/6/2004	6.16	4.98	-0.213	0.423	0.312	-0.304	0.242	0.059	-1.411	44.2
11/3/2004	4.39	3.70	-0.171	0.558	0.503	-0.104	0.145	0.024	-1.799	42.1
12/2/2004	7.52	5.82	-0.256	0.662	0.500	-0.281	0.272	0.038	-1.968	48.9
1/5/2005	6.22	5.01	-0.216	0.601	0.508	-0.168	0.477	0.051	-2.236	48.1
2/3/2005	4.54	3.79	-0.181	0.764	0.659	-0.148	0.217	0.045	-1.573	52.4
3/1/2005	4.34	3.53	-0.207	0.628	0.530	-0.170	0.196	0.047	-1.428	54.2
4/5/2005	7.62	6.14	-0.216	0.898	0.780	-0.141	0.295	0.070	-1.438	53.7
5/3/2005	7.06	5.93	-0.174	0.814	0.723	-0.119	0.268	0.063	-1.448	53
6/2/2005	5.81	5.1	-0.130	0.735	0.640	-0.138	0.097	0.040	-0.886	55
7/7/2005	6.77	5.92	-0.134	0.677	0.581	-0.153	0.293	0.083	-1.261	46.9
8/2/2005	5.07	4.48	-0.124	0.612	0.547	-0.112	0.164	0.036	-1.516	47.5
9/12/2005	5.02	4.5	-0.109	0.556	0.278	-0.693	0.106	0.029	-1.296	32.6
10/18/2005	4.91	3.92	-0.225	0.396	0.333	-0.173	0.072	.015 ND	---	46.3
COUNT	15	15	15	15	15	15	15	15	14	15
AVERAGE	5.82	4.88	-0.175	0.6198	0.515	-0.200	0.227	0.054	-1.478	47.907
STD. DEV.	1.11	0.875	0.046	0.150	0.152	0.148	0.118	0.031	0.343	5.731
90TH PERCENTILE	---	---	**0.89**	---	---	**0.99**	---	---	**0.35**	---
1998 - 2000 STUDY			**COPPER 0.80**			**LEAD 0.66**			**SILVER 0.20**	

	RECEIVING WATER COPPER			RECEIVING WATER LEAD			RECEIVING WATER SILVER			
DATE	**TOTAL**	**DISSOLVED**	**Ln(DISSOLVED/TOTAL)**	**TOTAL**	**DISSOLVED**	**Ln(DISSOLVED/TOTAL)**	**TOTAL**	**DISSOLVED**	**Ln(DISSOLVED/TOTAL)**	**TOTAL**
3/4/2004	0.87	0.51	0.586	0.098	0.029	0.296	0.015 ND	0.015 ND	---	1.55
9/8/2004	0.88	0.56	0.636	0.085	0.015 ND	---	0.015 ND	0.015 ND	---	0.73
10/6/2004	0.71	0.5	0.704	0.059	0.015 ND	---	0.015 ND	0.015 ND	---	0.57
11/3/2004	0.64	0.39	0.609	0.087	0.015 ND	---	0.015 ND	0.015 ND	---	0.77
12/2/2004	0.45	0.32	0.711	0.035	0.015 ND	---	0.015 ND	0.015 ND	---	0.39
1/5/2005	0.49	0.33	0.673	0.034	0.015 ND	---	0.015 ND	0.015 ND	---	0.52
2/3/2005	0.56	0.33	0.589	0.05	0.015 ND	---	0.015 ND	0.015 ND	---	1.34
3/1/2005	0.37	0.32	0.865	0.027	0.015 ND	---	0.015 ND	0.015 ND	---	0.4
4/5/2005	1.16	0.55	0.474	0.238	0.044	0.185	0.015 ND	0.015 ND	---	2.07
5/3/2005	0.68	0.58	0.853	0.072	0.015 ND	---	0.015 ND	0.015 ND	---	0.92
6/2/2005	0.62	0.38	0.613	0.095	0.015 ND	---	0.015 ND	0.015 ND	---	0.66
7/7/2005	0.73	0.42	0.575	0.134	0.015 ND	---	0.015 ND	0.015 ND	---	1.36
8/2/2005	0.67	0.4	0.597	0.105	0.015 ND	---	0.015 ND	0.015 ND	---	1.02
9/12/2005	0.93	0.47	0.505	0.14	0.015 ND	---	0.015 ND	0.015 ND	---	1.07
10/2/2005	---	---	---	---	---	---	---	---	---	---
MINIMUM	0.37	0.32	0.474	0.027	0.029	0.185	---	---	---	0.39
MAXIMUM	1.16	0.58	0.865	0.238	0.044	0.296	---	---	---	2.07
AVERAGE	0.697	0.433	0.642	0.090	0.037	0.240	---	---	---	0.955
STDEV.	0.20996075	0.094415495	0.113	0.055	0.011	0.079	---	---	---	---
90TH PERCENTILE	---	---	**0.79**	---	---	**0.34**	---	---	---	---
1998 - 2000 STUDY			**COPPER 0.56**			**LEAD 0.28**			**SILVER** ---	

EFFLUENT ZINC			EFFLUENT NICKEL			EFFLUENT CHROMIUM			EFFLUENT CADMIUM		
TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)
46	43.5	-0.056	---	---	---	---	---		---	---	---
47.7	47.3	-0.008	0.660	0.69	0.044	0.255	0.188	-0.305	0.063	0.059	-0.066
44.2	40.7	-0.082	---	---	---	---	---	---	---	---	---
42.1	40.2	-0.046	---	---	---	---	---	---	---	---	---
48.9	45.9	-0.063	1.18	1.05	-0.117	0.7 ND	0.7 ND	---	0.087	0.085	-0.023
48.1	45.1	-0.064	---	---	---	---	---	---	---	---	---
52.4	52.1	-0.006	---	---	---	---	---	---	---	---	---
54.2	51.7	-0.047	0.780	0.77	-0.013	0.39	0.14	-1.025	0.094	0.094	0.000
53.7	50.9	-0.054	---	---	---	---	---	---	---	---	---
53	52.4	-0.011	---	---	---	---	---	---	---	---	---
55	52.1	-0.054	0.840	0.74	-0.127	0.43	0.33	-0.265	0.078	0.075	-0.039
46.9	44.8	-0.046	---	---	---	---	---	---	---	---	---
47.5	47.3	-0.004	---	---	---	---	---	---	---	---	---
32.6	31.1	-0.047	0.53	0.5	-0.058	0.07 ND	0.07 ND	---	0.038	0.036	-0.054
46.3	43	-0.074	---	---	---	---	---	---	---	---	---
15	15	15	5	5	5	3	3	3	5	5	5
47.907	45.873	-0.044	0.798	0.75	-0.054	0.358	0.219	-0.531	0.072	0.0698	-0.036
5.731	5.833	0.025	0.244	0.198	0.072	0.092	0.099	0.428	0.022	0.023	0.026
---	---	**0.99**	---	---	**1.0**	---	---	**1.0**	---	---	**1.0**
		ZINC 0.91			**NICKEL 0.96**			**CHROMIUM 0.80**			**CADMIUM 0.89**

RECEIVING WATER ZINC			RECEIVING WATER NICKEL			RECEIVING WATER CHROMIUM			RECEIVING WATER CADMIUM		
TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)
1.55	0.79	0.510			---			---	---	---	---
0.73	0.22	0.301	0.43	0.15	0.349	0.195	0.07	0.359	0.008 ND	0.008 ND	---
0.57	0.24	0.421	---	---	---	---	---	---	---	---	---
0.77	0.25	0.325	---	---	---	---	---	---	---	---	---
0.39	0.24	0.615	0.45	0.31	0.689	0.7 ND	0.7 ND	---	0.008 ND	0.008 ND	---
0.52	0.23	0.442	---	---	---	---	---	---	---	---	---
1.34	0.4	0.299	---	---	---	---	---	---	---	---	---
0.4	0.37	0.925	0.39	0.23	0.590	0.08	0.07	0.875	0.008 ND	0.008 ND	---
2.07	1.02	0.493	---	---	---	---	---	---	---	---	---
0.92	0.49	0.533	---	---	---	---	---	---	---	---	---
0.66	0.22	0.333	0.6	0.34	0.567	0.34	0.11	0.324	0.008 ND	0.008 ND	---
1.36	0.5	0.368	---	---	---	---	---	---	---	---	---
1.02	0.24	0.235	---	---	---	---	---	---	---	---	---
1.07	0.23	0.215	0.49	0.2	0.408	0.07 ND	0.07 ND	---	0.008 ND	0.008 ND	---
---	---	---	---	---	---	---	---	---	---	---	---
0.39	0.22	0.215	0.39	0.15	0.349	0.08	0.07	0.324	---	---	---
2.07	1.02	0.925	0.6	0.34	0.689	0.34	0.11	0.875	---	---	---
0.955	0.389	0.430	0.472	0.246	0.520	0.205	0.083	0.519	---	---	---
---	---	0.185			0.139			0.309			---
---	---	**0.67**			**0.70**			0.91			---
		ZINC 0.57			**NICKEL 0.82**			**CHROMIUM 0.44**			**CADMIUM 1.2**

EFFLUENT SELENIUM			EFFLUENT ARSENIC			EFFLUENT MERCURY		
TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)
---	---	---	---	---	---	---	---	---
0.186	0.148	-0.229	0.841	0.884	0.050	0.0039	0.00181	-0.773
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.511	0.565	0.100	0.95	0.91	-0.043	0.0074	0.00271	-1.009
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.203	0.185	-0.093	1.46	1.38	-0.056	0.0048	0.0016	-1.105
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.11	0.086	-0.246	0.968	0.973	0.005	0.0038	0.00153	-0.918
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.108	0.081	-0.288	1.03	0.989	-0.041	0.0026	0.0009	-1.041
---	---	---	---	---	---	---	---	---
5	5	5	5	5	5	5	5	5.000
0.2236	0.213	-0.151	1.050	1.027	-0.017	0.0045	0.00171	-0.969
0.166	0.202	0.158	0.239	0.202	0.044	0.002	0.001	0.129
---	---	**1.1**	---	---	**1.0**	---	---	**0.45**
		SELENIUM 1.03			**ARSENIC 0.94**			**MERCURY 0.27**

RECEIVING WATER SELENIUM			RECEIVING WATER ARSENIC			RECEIVING WATER MERCURY		
TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)	TOTAL	DISSOLVED	Ln(DISSOLVED/TOTAL)
---	---	---	---	---	---	---	---	---
0.05 ND	0.05 ND	---	0.26	0.224	0.862	0.0017	0.00063	0.375
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.3 ND	0.3 ND	---	0.39	0.34	0.872	0.0006	0.00052	0.912
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.05 ND	0.05 ND	---	0.229	0.198	0.865	0.0006	0.00034	0.531
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.05 ND	0.05 ND	---	0.293	0.264	0.901	0.0009	0.0005	0.532
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
0.05 ND	0.05 ND	---	0.423	0.328	0.775	0.0017	0.0005	0.287
---	---	---	---	---	---	---	---	---
---	---	---	0.229	0.198	0.775	0.0006	0.00034	0.287
---	---	---	0.423	0.34	0.901	0.0017	0.00063	0.912
---	---	---	0.319	0.271	0.855	0.001	0.0005	0.528
		---			0.047			0.239
		---			0.92			0.83
		SELENIUM 1.1			**ARSENIC 1.0**			**MERCURY 0.70**

Parameter	Metal Criteria Translator as decimal Acute	Metal Criteria Translator as decimal Chronic	Ambient Concentration (metals as dissolved) *ug/L*	State Water Quality Standard		Max concentration at edge of...		LIMIT REQ'D?	Effluent percentile value	*Pn*	Max effluent conc. measured (metals as total recoverable) *ug/L*	Coeff Variation *CV*	*s*	# of samples *n*
				Acute *ug/L*	Chronic *ug/L*	Acute Mixing Zone *ug/L*	Chronic Mixing Zone *ug/L*							
COPPER	0.89	0.89	0.580	9.17	5.03	6.96	1.86	**NO**	0.95	0.902	11.50	0.27	0.27	29
LEAD	0.99	0.99	0.044	31.4	0.881	0.60	0.15	**NO**	0.95	0.911	0.90	0.30	0.29	32
SILVER	0.35	0.35	0.015	1.12	---	0.25	0.06	**NO**	0.95	0.911	0.96	0.67	0.61	32
ZINC	0.99	0.99	1.020	65.7	46.7	38.5	8.52	**NO**	0.95	0.911	61.6	0.16	0.16	32
NICKEL	1.04	1.04	0.340	813	70.3	1.70	0.61	**NO**	0.95	0.688	1.33	0.60	0.55	8
CHROMIUM	1.02	1.02	0.700	15.0	81.7	1.09	0.78	**NO**	0.95	0.688	0.70	0.60	0.55	8
CADMIUM	1.00	1.00	0.008	1.82	0.510	0.11	0.03	**NO**	0.95	0.688	0.10	0.60	0.55	8
SELENIUM	1.05	1.05	0.300	20.0	5.00	0.73	0.39	**NO**	0.95	0.688	0.51	0.60	0.55	8
ARSENIC	1.04	1.04	0.340	360	190	1.86	0.64	**NO**	0.95	0.688	1.46	0.60	0.55	8
MERCURY	0.45	0.45	0.001	2.10	0.012	0.00	0.00	**NO**	0.95	0.652	0.01	0.60	0.55	7

1998 - 2000 Metals Concentrations Evaluated at Revised Dilutions, Valid Hardness, and Calculated CVs

Parameter	Metal Criteria Translator as decimal Acute	Metal Criteria Translator as decimal Chronic	Ambient Concentration (metals as dissolved) *ug/L*	State Water Quality Standard		Max concentration at edge of...		LIMIT REQ'D?	Effluent percentile value	*Pn*	Max effluent conc. measured (metals as total recoverable) *ug/L*	Coeff Variation *CV*	*s*	# of samples *n*
				Acute *ug/L*	Chronic *ug/L*	Acute Mixing Zone *ug/L*	Chronic Mixing Zone *ug/L*							
COPPER	0.80	0.80	0.580	9.69	5.10	7.95	2.05	**NO**	0.95	0.717	12.10	0.27	0.27	9
LEAD	0.66	0.66	0.032	33.5	0.897	1.79	0.38	**NO**	0.95	0.717	3.28	0.30	0.29	9
SILVER	0.20	0.20	0.010	1.23	---	0.25	0.06	**NO**	0.95	0.717	1.07	0.67	0.61	9
ZINC	0.91	0.91	0.988	69.0	47.3	66.3	14.02	**NO**	0.95	0.717	102.0	0.16	0.16	9

1999 Effluent Characterization
Toxic Organics

Parameter	Units	Maximum Value	MDL	Number of Detections
Bromodichloromethane	µg/L	0.054	0.04	1
n-Butylbenzene	µg/L	0.15	0.057	1
Butylbenzylphthalate	µg/L	0.076	0.071	1
Chloroform	µg/L	5.1	0.049	1
Di-n-Butylphthalate	µg/L	5.9	0.15	3
1,4-Dichlorobenzene	µg/L	1.8	0.13	1
cis-1,2-Dichloroethene	µg/L	0.06	0.031	1
Ethylbenzene	µg/L	0.067	0.048	1
4-Isopropyltoluene	µg/L	1.6	0.048	1
Methylene chloride	µg/L	1.3	0.13	1
Naphthalene	µg/L	0.2	0.13	1
Styrene	µg/L	0.071	0.058	1
Tetrachloroethene	µg/L	1.5	0.037	1
Toluene	µg/L	1.3	0.047	3
Trichloroethene	µg/L	0.089	0.033	1
1,1,1-Trichloroethane	µg/L	0.15	0.026	1
1,3,5-Trimethylbenzene	µg/L	0.18	0.054	1
1,2,4-Trimethylbenzene	µg/L	0.61	0.058	1
m,p-Xylene	µg/L	0.24	0.086	1
o-Xylene	µg/L	0.12	0.049	1

2003 Effluent Characterization

Toxic Organic Compounds					
Chloroform	µg/L	3.46	2.14	0.049	3
Toluene	µg/L	2.54	1.51	1.0	3

Yakima STP Comprehensive WET Test Data Record

Yakima WWTP Chronic WET Test Results as NOEC/LOEC in % Effluent								
Test #	Sample Date	Start Date	Lab	Organism	Endpoint	NOEC	LOEC	MSDp
KJOH767	May 24, 1994	May 24, 1994	King County Lab	*Ceriodaphnia dubia*	7-day Survival	25	50	
					Reproduction	25	50	18.18%
KJOH766	May 24, 1994	May 24, 1994	King County Lab	fathead minnow	7-day Survival	100	> 100	
					Biomass	100	> 100	70.43%
					Weight	100	> 100	33.54%
AQTX0432	October 3, 1995	October 3, 1995	King County Lab	fathead minnow	7-day Survival	100	> 100	4.35%
					Biomass	50	100	11.58%
					Weight	50	100	10.28%
AQTX1020	May 23, 1996	May 23, 1996	King County Lab	*Ceriodaphnia dubia*	7-day Survival	50	100	
					Reproduction	50	100	33.79%
AQTX1021	May 23, 1996	May 23, 1996	King County Lab	fathead minnow	7-day Survival	100	> 100	
					Biomass	100	> 100	11.84%
					Weight	100	> 100	11.84%
AQTX0954	October 17, 1996	October 17, 1996	King County Lab	*Ceriodaphnia dubia*	7-day Survival	12.5	25	
					Reproduction	12.5	25	16.74%
AQTX0953	October 17, 1996	October 17, 1996	King County Lab	fathead minnow	7-day Survival	100	> 100	5.77%
					Biomass	50	100	11.93%
					Weight	50	100	12.36%
AQTX1490	November 6, 1997	November 7, 1997	King County Lab	*Ceriodaphnia dubia*	7-day Survival	50	100	
					Reproduction	< 6.25	6.25	8.41%
AQTX1562	November 28, 1997	November 29, 1997	King County Lab	*Ceriodaphnia dubia*	7-day Survival	66.2	> 66.2	
					Reproduction	< 15.1	15.1	16.97%
AQTX1563	December 5, 1997	December 6, 1997	King County Lab	*Ceriodaphnia dubia*	7-day Survival	66.2	> 66.2	
					Reproduction	15.1	66.2	19.00%
AQTX1564	December 12, 1997	December 13, 1997	King County Lab	*Ceriodaphnia dubia*	7-day Survival	66.2	> 66.2	
					Reproduction	66.2	> 66.2	16.69%
1476CDCYK	March 21, 1998	March 21, 1998	King County Lab	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	22.47%
AQTX1809	May 1, 1998	May 2, 1998	King County Lab	*Ceriodaphnia dubia*	7-day Survival	15.1	66.2	
					Reproduction	15.1	66.2	11.18%
AQTX002495	June 29, 1999	June 30, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	31.74%
AQTX002494	June 29, 1999	June 30, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	31.01%

AQTX002493	August 9, 1999	August 10, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	32.60%
AQTX002496	August 11, 1999	August 12, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	76.36%
AQTX002492	September 27, 1999	September 28, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	25	66.2	
					Reproduction	25	66.2	30.27%
AQTX002490	October 26, 1999	October 26, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	28.02%
AQTX002488	November 16, 1999	November 16, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	22.53%
AQTX002486	December 14, 1999	December 14, 1999	Parametrix	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	25.74%
AQTX002484	June 19, 2000	June 20, 2000	Parametrix	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	22.30%
AQTX002481	September 11, 2000	September 12, 2000	Parametrix	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	100	> 100	19.13%
AQTX002479	October 23, 2000	October 24, 2000	Parametrix	*Ceriodaphnia dubia*	7-day Survival	25	66.2	
					Reproduction	25	66.2	28.10%
AQTX002477	November 13, 2000	November 14, 2000	Parametrix	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	21.17%
AQTX002468	December 11, 2000	December 12, 2000	Parametrix	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	14.64%
AQTX002597	August 14, 2001	August 14, 2001	Parametrix	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	15.11%
AQTX002802	November 27, 2001	November 27, 2001	Parametrix	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	100	> 100	38.39%
AQTX002804	December 13, 2001	December 13, 2001	Parametrix	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	24.89%
AQTX003212	June 11, 2002	June 11, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	13.61%
khan058	October 15, 2002	October 15, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	25	66.2	
					Reproduction	66.2	100	18.31%
khan068	November 5, 2002	November 5, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	23.51%
khan067	December 17, 2002	December 17, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	44.76%
khan062	September 2, 2003	September 2, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	< 6.25	6.25	
					Reproduction	< 6.25	6.25	15.59%
khan063unf	September 23, 2003	September 23, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	26.67%
khan064fil	September 23, 2003	September 23, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	28.51%
khan065	November 4, 2003	November 4, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	25	66.2	
					Reproduction	25	66.2	18.32%
khan073	March 23, 2004	March 23, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	16.41%
khan075	September 9, 2004	September 9, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	17.08%
KPER163	November 3, 2004	November 4, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	26.71%
khan070	March 9, 2005	March 9, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	23.53%
khan060	September 26, 2005	September 27, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	66.2	100	
					Reproduction	66.2	100	22.62%
khan076	November 7, 2005	November 8, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	7-day Survival	100	> 100	
					Reproduction	100	> 100	33.27%

Yakima WWTP Acute WET Test Results as % Survival in 100% Effluent						
Test #	Sample Date	Start Date	Lab	Organism	Endpoint	% Survival
SSIN511	not recorded	June 2, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100%
SSIN512	not recorded	June 9, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	90%
SSIN513	not recorded	June 16, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100%
SSIN514	not recorded	June 23, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100%
SSIN515	not recorded	June 30, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	95%
SSIN516	not recorded	July 9, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100%
SSIN517	not recorded	July 14, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	95%
SSIN518	not recorded	July 21, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	85%
KJOH765	May 24, 1994	May 24, 1994	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	75%
KJOH764	May 24, 1994	May 24, 1994	King County Lab	fathead minnow	96-hour Survival	100%
AQTX0429	October 3, 1995	October 3, 1995	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	0%
AQTX0430	October 3, 1995	October 3, 1995	King County Lab	fathead minnow	96-hour Survival	97%
AQTX1022	May 23, 1996	May 23, 1996	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX1023	May 23, 1996	May 23, 1996	King County Lab	fathead minnow	96-hour Survival	100%
AQTX0952	October 17, 1996	October 17, 1996	King County Lab	fathead minnow	96-hour Survival	100%
AQTX0951	October 20, 1996	October 20, 1996	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	0%
AQTX1489	November 6, 1997	November 7, 1997	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	5%
AQTX002491	September 27, 1999	September 28, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002489	October 26, 1999	October 26, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	95%
AQTX002487	November 16, 1999	November 16, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002485	December 14, 1999	December 14, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002483	June 19, 2000	June 20, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002482	August 21, 2000	August 22, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002480	September 13, 2000	September 14, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002478	October 23, 2000	October 24, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002476	November 13, 2000	November 14, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002467	December 11, 2000	December 12, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002596	August 14, 2001	August 14, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002613	September 11, 2001	September 11, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002801	November 27, 2001	November 27, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100%
AQTX002803	December 13, 2001	December 13, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	95%
AQTX003213	June 11, 2002	June 11, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
khan059	October 17, 2002	October 17, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
RMAR400	November 7, 2002	November 7, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
RMAR401	December 19, 2002	December 19, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
khan072	August 6, 2003	August 6, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
khan071	October 2, 2003	October 2, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
khan074	March 23, 2004	March 23, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
KPER161	August 10, 2004	August 10, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
KPER162	October 5, 2004	October 5, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
KHAN069	March 9, 2005	March 10, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
khan066	August 3, 2005	August 4, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%
khan061	October 19, 2005	October 20, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100%

Yakima WWTP Acute WET Test Results as NOEC/LOEC in % Effluent								
Test #	Sample Date	Start Date	Lab	Organism	Endpoint	NOEC	LOEC	MSDp
SSIN511	not recorded	June 2, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
SSIN512	not recorded	June 9, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
SSIN513	not recorded	June 16, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
SSIN514	not recorded	June 23, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
SSIN515	not recorded	June 30, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
SSIN516	not recorded	July 9, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
SSIN517	not recorded	July 14, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
SSIN518	not recorded	July 21, 1993	Yakima WWTP	*Daphnia pulex*	48-hour Survival	100	> 100	
KJOH765	May 24, 1994	May 24, 1994	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	50	100	7.72%
KJOH764	May 24, 1994	May 24, 1994	King County Lab	fathead minnow	96-hour Survival	100	> 100	
AQTX0429	October 3, 1995	October 3, 1995	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	50	100	11.71%
AQTX0430	October 3, 1995	October 3, 1995	King County Lab	fathead minnow	96-hour Survival	100	> 100	
AQTX1022	May 23, 1996	May 23, 1996	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX1023	May 23, 1996	May 23, 1996	King County Lab	fathead minnow	96-hour Survival	100	> 100	
AQTX0952	October 17, 1996	October 17, 1996	King County Lab	fathead minnow	96-hour Survival	100	> 100	
AQTX0951	October 20, 1996	October 20, 1996	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	50	100	
AQTX1489	November 6, 1997	November 7, 1997	King County Lab	*Ceriodaphnia dubia*	48-hour Survival	66.2	100	7.80%
AQTX002491	September 27, 1999	September 28, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	4.21%
AQTX002489	October 26, 1999	October 26, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	4.21%
AQTX002487	November 16, 1999	November 16, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002485	December 14, 1999	December 14, 1999	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	4.21%
AQTX002483	June 19, 2000	June 20, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	7.50%
AQTX002482	August 21, 2000	August 22, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002480	September 13, 2000	September 14, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002478	October 23, 2000	October 24, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002476	November 13, 2000	November 14, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002467	December 11, 2000	December 12, 2000	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002596	August 14, 2001	August 14, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002613	September 11, 2001	September 11, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002801	November 27, 2001	November 27, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	
AQTX002803	December 13, 2001	December 13, 2001	Parametrix	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	11.71%
AQTX003213	June 11, 2002	June 11, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	8.28%
khan059	October 17, 2002	October 17, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	9.20%
RMAR400	November 7, 2002	November 7, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	9.20%
RMAR401	December 19, 2002	December 19, 2002	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	9.20%
khan072	August 6, 2003	August 6, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	5.00%
khan071	October 2, 2003	October 2, 2003	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	10.86%
khan074	March 23, 2004	March 23, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	9.20%
KPER161	August 10, 2004	August 10, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	9.21%
KPER162	October 5, 2004	October 5, 2004	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	5.00%
KHAN069	March 9, 2005	March 10, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	19.31%
khan066	August 3, 2005	August 4, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	9.20%
khan061	October 19, 2005	October 20, 2005	Nautilus Environmental	*Ceriodaphnia dubia*	48-hour Survival	100	> 100	5.00%

APPENDIX D--RESPONSE TO COMMENTS

The City of Yakima appreciates the opportunity to provide the following comments on the City's draft NPDES Wastewater Discharge Permit and Fact Sheet. Most of our comments are asking for more clarification or editorial.

City of Yakima Permit Comments:

Page 4 - In the Table, "90 days following first test" should be removed from the first submittal date for the Annual Acute Effluent Toxicity Test Report. The Acute Effluent Toxicity Test Report is due annually (See S.9. B.). Also, the Acute Effluent Toxicity Test Report is included in the Annual Pretreatment Report (due by April 15).... would this be sufficient for the yearly Acute Effluent Toxicity Test Report (due by January 31st)? If so, the first submittal date should read: "April 15, 2007 (with Pretreatment Report)". If not, the first submittal date should read: "January 31, 2007".

Department response:

Language changed as requested.

City of Yakima Permit Comments:

Page 15 – S5.D – Clarification is needed for the Reliability Class II requirements for back-up power. It should be made clear that the City has until March 31, 2008 to have additional back-up power installed. We would, therefore, suggest that the second paragraph of this section read as follows:

> The Permittee shall maintain Reliability Class II (EPA 430-99-74-001) at the wastewater treatment plant. The Permittee shall install an additional back-up generator and the Permittee shall submit a letter to the Department that the back-up system is operational by **March 31, 2008**. This backup power source must be sufficient to operate all vital components and critical lighting and ventilation during peak wastewater flow conditions, except vital components used to support the secondary processes (i.e., mechanical aerators or aeration basin air compressors) need not be operable to full levels of treatment, but shall be sufficient to maintain the biota.

Department response:

Language changed as requested.

City of Yakima Permit Comments:

Page 19 - S6. A. b. - The Department has written this section to read, that the City of Yakima is responsible for issuing waste discharge permits to all SIUs contributing to the treatment system. Since both Union Gap and Terrace Heights contribute to the treatment system, this could imply that all SIUs located within the respective jurisdictions of Union Gap and Terrace Heights be permitted by the City of Yakima as well. This is not the procedure the Department and the City have been following since the City assumed its delegated pretreatment program nor is it the procedure contemplated in the City's approved pretreatment program submittal entitled "Industrial Pretreatment Program" and dated June, 2000. Currently, within their respective jurisdictions, the responsibility for sampling, testing, and reporting is conducted by both Union Gap and Terrace Heights, while the issuance and managing of the waste discharge permits is performed by the Department. The City of Yakima is requesting clarification from the Department for this significant change in responsibility, and strongly recommends retaining the language from the previous permit for this particular issue, which would read as follows:

> Issue industrial waste discharge permits to all significant industrial users {SIUs, as defined in 40 CFR 403.3(t)(i)(ii) contributing to the treatment system from within the City's jurisdiction. The Department shall continue to issue permits for dischargers in other jurisdictions, as appropriate. Industrial waste discharge permits shall contain as a minimum, all the requirements of 40 CFR 403.8(f)(1)(iii). The Permittee shall coordinate the permitting process with the Department regarding any industrial facility, which may possess a State Waste Discharge Permit issued by the Department. Once issued, an industrial waste discharge permit will take precedence over a state-issued waste discharge permit.

Department response:

Language changed as requested.

City of Yakima Permit Comments:

Page 26 – S9B.1. – If the Department is amenable to having the City include its Annual Acute Effluent Toxicity Test Report with its annual Pretreatment Report, the first sentence of this paragraph should be revised to read as follows: "All reports for effluent characterization or compliance monitoring **shall be submitted annually no later than the 15th of April (with the Pretreatment Report)** for each year … format and content."

Department response:

Language changed as requested.

City of Yakima Permit Comments:

Fact Sheet:

Page 29- The following sentence contains an extra space following the comma:
The 2004 and 2005 effluent characteristics did not detect any pesticides including Beta Endosulfan, therefore no limit will be required.

Department response:

Changed as requested

City of Yakima Permit Comments:

Page 35- Footnote #2 needs to be deleted and replaced with #3.

Department response:

Changed as requested

City of Yakima Permit Comments:

Page 38 - Pretreatment Section (2nd paragraph***)*** Replace the **24** non-categorical with **22** non-categorical. The number of SIUs has changed since the time the information was submitted to Ecology in 2005. Yakima Brewing Company is no longer producing beer (as of September 30, 2005) and US Syntec was reclassified from an SIU to an MIU (November 2005).

Department response:

Changed as requested